Vol. 938 Number 5

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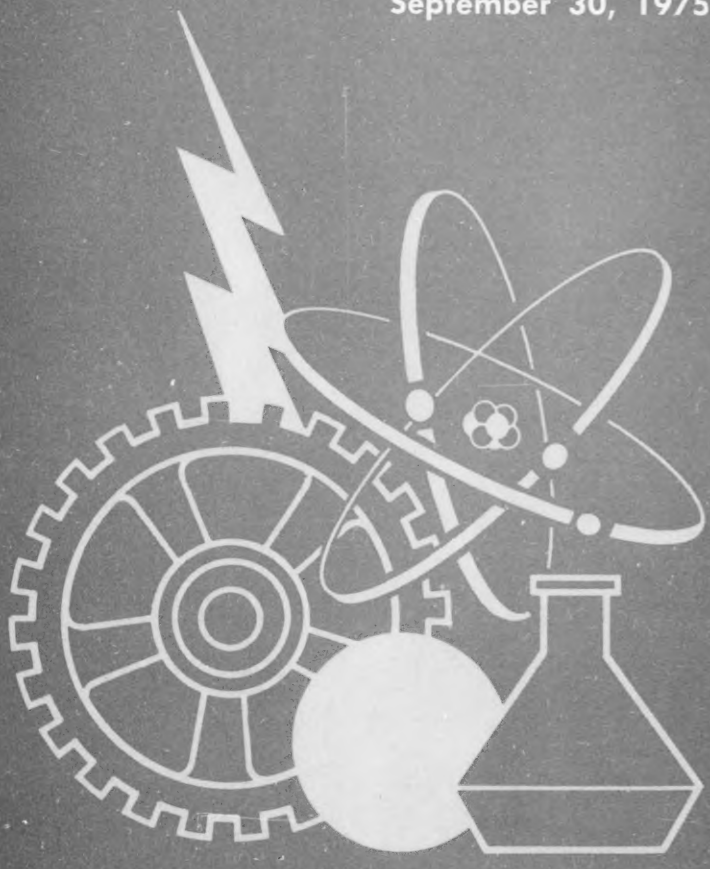
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 30, 1975



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

September 30, 1975 Volume 938 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of August 1975

Examiner affirmed	238
Examiner affirmed in part	45
Examiner reversed	100
Total	383

Improvements for the Public Search Room

The Patent and Trademark Office is making concerted efforts to improve conditions in the Public Search Room to better meet the needs of the users. The emphasis is being placed on actions which are practical and can be instituted immediately.

The most critical need is for additional equipment to house classified patent documents. Search file growth and reclassification projects continue to overcrowd existing filing equipment or relegate entire classes to inaccessible bulk storage. Previous efforts to procure additional storage equipment were frustrated by what appeared to be a lack of floor space, and no additional space was available.

A special task force was recently established to explore the problem with the objective of recommending a solution for immediate implementation. The task force report included a recommendation to avoid the inflexibility of the extremely high cost and excessive delivery time required for the large conventional custom-fabricated file units. Instead, the suggestion was made to purchase small, standard, inexpensive modular units that could be acquired rapidly. After a successful search for modular units that would meet our needs, a test purchase of forty (40) such units was made, and 150,000 patents, which had been stored in boxes, were made accessible for search.

User evaluation of the test purchase units was considered, and a further search for a superior type of standard modular unit identified equipment which, it is believed, will satisfy most of the needs and desires of the users.

As a result of acceptance of modular units, it was determined that by making use of space along walls and at the ends of file columns in the existing area allocated for patent search files and by minor rearrangement of some search desks, it will be possible to house an additional 375 of these smaller filing units. This should be sufficient to provide for search file expansion for the next four years. Moreover, the economic cost of these units will permit their acquisition from available funds.

Procurement of these units is now underway. Installation is expected to begin by November, with expansion of the search files into the new equipment scheduled for completion by June, 1976.

The placement of the new equipment is, of course, a matter of great interest to the users of the Public Search Room. As a result of careful maximization of the floor space available, it will be possible to locate all the new equipment within the present boundaries of the Public Search Room. Every effort has been made to insure a minimal impact on the Search Room from the users' standpoint.

A second item of major concern to users of the Public Search Room is the integrity of the search files. Patents are removed from the file for copying or for other purposes and are not always returned to their proper location. Efforts to improve file integrity, which have been implemented or are contemplated, include the following:

1. A voluntary cooperative program, suggested by users, has been adopted whereby a searcher, on request, is provided by the Office with subclass lists. The searcher in turn informs the Office of any patents missing from the search file. The Office then promptly replaces the missing copies and inserts the record of the integrity check in the appropriate bundle.
2. Measures are under consideration to exercise greater security over the exits from the Search Room to prevent removal of patents from the classified search file.
3. A centralized, coin-operated, copying facility for the entire Search Room, operated by Office employees, is contemplated to replace the present user-operated machines. Patents would be copied only if brought to the copying machines as part of the bundle in which they belong. This will permit immediate replacement of the individual patents and bundles in their proper location after copying.
4. Investigations are being conducted into various systems which would alert a searcher that a patent or patents are missing from a bundle.

In addition, other projects are underway to improve the general condition of the Public Search Room. Among these projects are the following:

1. A directory is being developed which will indicate the specific locations of all classes available in the search file.
2. A guide or fact sheet is planned for the new or "first time" user of the Public Search Room.
3. The relocation and improvement of the viewing equipment for the numeric microfilm files will be made shortly.
4. A refiling, expansion and rearrangement program for the search files which began in September, 1974 has already been completed for classes 2–165. This project has been temporarily suspended due to a lack of storage space, but it will be continued as the new storage equipment becomes available. It will further ultimately result in the bulk of the classes being physically arranged in numerical sequence. This program will also be completed by the end of June, 1976.
5. A program to inventory the reference materials in the Search Room, such as the Classification Manuals and the class definitions, will be instituted with a view toward insuring their accuracy and completeness.

The Patent and Trademark Office is earnestly striving to improve conditions in the Public Search Room. There are many things that can and will be done by the Office to this end. The cooperation of the public in properly utilizing the Search Room resources is also essential to their proper maintenance.

Any comments or suggestions you may have with regard to the Public Search Room would be appreciated and will be given careful consideration. Such comments or suggestions should be directed to the Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Aug. 29, 1975.

ERRATUM

In the notice of Defensive Publication T934,011 appearing on page 10 in the OFFICIAL GAZETTE of May 6, 1975, three paragraphs of the abstract following the printed paragraph were omitted and should be added. The three paragraphs are as follows:

Of particular importance is a running surface maintained between the retaining member and the wrapped packet surface, the running surface moving in the same direction and speed of the packet. This surface is conveniently an endless belt of a synthetic polymeric film, for example a polyester optionally coated with a PTFE lubricant, and is used to avoid frictional drag being placed on the packet.

Other acceptable wrapping materials include wrappers coated with an adhesive, for instance a heat-sealable adhesive as copolymers of vinylidene chloride with acrylonitrile.

The method and apparatus are particularly adapted to wrap packets of a cubical or right rectangular configurations in batch-type operations or integration into a packet-filling and wrapping production line.

1995

Certificates of Correction for the Week of Sept. 30, 1975

Re. 28,389	3,862,450	3,882,305	3,892,199
Re. 28,433	3,862,666	3,882,477	3,892,291
D. 236,197	3,862,855	3,882,696	3,892,577
D. 236,198	3,862,989	3,883,004	3,892,627
3,399,442	3,862,996	3,883,186	3,892,908
3,411,548	3,864,354	3,883,320	3,893,078
3,525,584	3,865,654	3,883,518	3,893,210
3,583,976	3,866,062	3,883,541	3,893,260
3,669,745	3,866,235	3,884,059	3,893,269
3,671,006	3,866,696	3,884,123	3,893,390
3,689,859	3,867,339	3,884,166	3,893,603
3,700,471	3,870,642	3,884,219	3,893,678
3,732,851	3,870,946	3,884,342	3,893,862
3,744,904	3,871,721	3,884,516	3,893,989
3,745,220	3,871,962	3,884,651	3,893,997
3,760,295	3,873,219	3,884,722	3,894,033
3,764,714	3,873,312	3,884,857	3,894,245
3,766,337	3,873,529	3,884,872	3,894,261
3,782,373	3,873,566	3,885,026	3,894,265
3,790,157	3,873,734	3,885,066	3,894,568
3,799,893	3,874,307	3,885,911	3,894,573
3,803,663	3,874,615	3,885,964	3,894,595
3,804,716	3,875,104	3,886,125	3,894,750
3,805,569	3,875,281	3,886,193	3,894,862
3,809,572	3,875,360	3,886,297	3,895,034
3,809,901	3,875,374	3,886,561	3,895,230
3,813,412	3,875,523	3,886,591	3,895,233
3,815,361	3,875,835	3,886,732	3,895,307
3,818,382	3,876,495	3,887,361	3,895,468
3,821,740	3,876,512	3,887,474	3,895,528
3,822,914	3,876,597	3,887,508	3,895,704
3,830,221	3,876,868	3,887,732	3,895,707
3,830,855	3,878,469	3,887,858	3,895,823
3,834,010	3,878,528	3,888,660	3,895,970
3,835,782	3,879,272	3,888,662	3,895,997
3,836,283	3,879,507	3,888,809	3,896,049
3,836,663	3,879,551	3,888,845	3,896,148
3,840,110	3,879,558	3,888,997	3,896,299
3,842,432	3,879,664	3,889,061	3,896,302
3,843,428	3,879,852	3,889,171	3,896,482
3,846,297	3,880,177	3,889,402	3,896,672
3,847,600	3,880,532	3,889,883	3,896,904
3,848,064	3,880,578	3,890,227	3,897,505
3,848,724	3,880,698	3,890,326	3,898,131
3,849,504	3,880,746	3,890,339	3,898,207
3,849,990	3,880,917	3,890,489	3,898,260
3,851,024	3,881,134	3,890,821	3,898,301
3,851,216	3,881,290	3,890,926	3,898,372
3,854,945	3,881,340	3,891,021	3,898,379
3,856,993	3,881,613	3,891,043	3,899,499
3,857,525	3,881,834	3,891,199	3,899,705
3,857,850	3,881,930	3,891,474	
3,861,973	3,881,962	3,891,682	
3,862,307	3,882,086	3,891,957	

Errata

All reference to Patent Number 3,886,091 to Chester J. Kawiecki for Unitary Series Spark Gap With Aligned Apertures, appearing in the OFFICIAL GAZETTE of Feb. 11, 1975, should be deleted since the patent should not have been granted.

All reference to Patent Number 3,902,714 to Howard B. Carstedt of Minnesota for Automatic Sheet Decurler, appearing in the OFFICIAL GAZETTE of Sept. 2, 1975 should be deleted since no patent was granted.

All reference to Patent Number 3,902,871 to Lewis R. Honnen of California for Fuel Additive appearing in the OFFICIAL GAZETTE of Sept. 2, 1975 should be deleted since no patent was granted.

All reference to Patent Number 3,903,602 to Paul E. Klein of Oregon for Orthodontic Apparatus Including Unitary Dispenser and Dispensed Articles, appearing in the OFFICIAL GAZETTE of Sept. 9, 1975 should be deleted since no patent was granted.

All reference to Patent Number 3,905,928 to Robert C. Malpass et al. of North Carolina for Hot Melt Size and Yarn Sized Therewith, appearing in the OFFICIAL GAZETTE of Sept. 16, 1975 should be deleted since no patent was granted.

Dedications

3,444,286.—*William M. King*, Walnut, and *Paul A. Cantor*, Covina, Calif. REVERSE OSMOSIS MEMBRANE COMPOSITION AND MANUFACTURE OF THE MEMBRANE. Patent dated May 13, 1969. Dedication filed July 14, 1975, by the assignee, *Aerojet-General Corporation*.

Hereby dedicates to the Public the entire remaining term of said patent.

3,795,657.—*Robert William Howsam* and *Paul Alan Larson*, Lake Jackson, Tex. EPOXY RESIN COMPOSITIONS CONTAINING AROMATIC BIGUANIDES AS LATENT CURING AGENTS THEREFOR. Patent dated Mar. 5, 1974. Dedication filed Dec. 5, 1974, by the assignee, *The Dow Chemical Company*.

Hereby dedicates the remaining term of said patent to the People of the United States of America.

Disclaimers

3,302,297.—*Douglas L. Graham*, Wingate, Ind. DRYING APPARATUS AND METHOD. Patent dated Feb. 7, 1967. Disclaimer filed Sept. 17, 1973, by the assignee, *M & W Gear Company, Inc.*

Hereby enters this disclaimer to claims 1–10 of said patent.

3,502,908.—*Alton O. Christensen*, Houston, Tex. TRANSISTOR INVERTER CIRCUIT. Patent dated Mar. 24, 1970. Disclaimer filed July 17, 1975, by the assignee, *Shell Oil Company*.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5 and 6 of said patent.

3,531,620.—*Masayasu Arikawa*, Fujisawa-shi, *Izumi Ichihara*, Kamakura-shi, and *Shou Horiuchi*, Fujisawa-shi, Japan. ARC WELDING ELECTRODE FOR STEEL WITHOUT USING GAS OR THE LIKE. Patent dated Sept. 29, 1970. Disclaimer filed July 16, 1975, by the assignee, *Kobe Steel Ltd.*

Hereby enters this disclaimer to all claims of said patent.

3,589,023.—*Francis John Figiel*, Boonton, N.J. PROCESS AND APPARATUS FOR REMOVING WATER FROM SOLID SURFACES AT LOW TEMPERATURES. Patent dated June 29, 1971. Disclaimer filed July 22, 1975, by the assignee, *Allied Chemical Corporation*.

Hereby enters this disclaimer to claims 1, 11 and 12 of said patent.

3,647,843.—*David G. Walker*, Baytown, and *Donald A. Keyworth*, Houston, Tex. ACETYLENE-CUPROUS ALUMINUM TETRACHLORIDE COMPLEX AND A PROCESS FOR ITS PRODUCTION. Patent dated Mar. 7, 1972. Disclaimer filed Aug. 11, 1975, by the assignee, *Tenneco Chemicals, Inc.*

Hereby enters this disclaimer to claims 1–8, all of the claims of said patent.

3,654,579.—*Anthony D. Kurtz*, Englewood, N.J., *Joseph Mallon*, Philadelphia, Pa., and *Charles Gravel*, River Edge, N.J. ELECTROMECHANICAL TRANSDUCERS AND HOUSINGS. Patent dated Apr. 4, 1972. Disclaimer filed Aug. 8, 1975, by the assignee, *Kulite Semiconductor Products, Inc.*

Hereby enters this disclaimer to claim 9 of said patent.

3,713,209.—*John M. Biddison*, Dayton, Ohio. AUTOMATIC ARMATURE WINDING. Patent dated Jan. 30, 1973. Disclaimer filed Mar. 11, 1975, by the assignee, *The Globe Tool and Engineering Company*.

Hereby enters this disclaimer to claims, 1, 4, 6, 7, 8, 9, 11, 13 and 17 of said patent.

3,741,259.—*William Wood*, Gatley, *Mary Griffiths*, Heywood, and *John Sellers*, Chorley, England. CURTAIN HEADING TAPE. Patent dated June 26, 1973. Disclaimer filed Aug. 7, 1975, by the assignee, *Thomas French & Sons Limited*.

Hereby enters this disclaimer to all claims of said patent.

3,747,827.—*Stephen Stanton*, Baltimore, *Edward Varholy*, Glen Burnie, and *William Verwey*, Phoenix, Md. ELECTRONICALLY CONTROLLED STITCHING MACHINE. Patent dated July 24, 1973. Disclaimer filed Aug. 13, 1975, by the assignee, *Precision Industries, Inc.*

Hereby enters this disclaimer to claims 1–18 of said patent.

3,753,392.—*Edwin H. Land*, Cambridge, Mass. FILM-ADVANCING APPARATUS. Patent dated Aug. 21, 1973. Disclaimer filed July 23, 1975, by the assignee, *Polaroid Corporation*.

Hereby enters this disclaimer to claims 5–10 of said patent.

3,767,725.—*David G. Walker*, Baytown, and *Donald A. Keyworth*, Houston, Tex. METHOD OF TRANSPORTING ACETYLENE. Patent dated Oct. 23, 1973. Disclaimer filed Aug. 11, 1975, by the assignee, *Tenneco Chemicals, Inc.*

Hereby enters this disclaimer to claims 1–8, all of the claims of said patent.

3,833,622.—*John C. Babcock* and *J Allan Campbell*, Kalamazoo, Mich. CRYSTALLINE 25-HYDROXYCHOLECALCIFEROL HYDRATE AND STRUCTURALLY RELATED COMPOUNDS. Patent dated Sept. 3, 1974. Disclaimer filed July 18, 1975, by the assignee, *The Upjohn Company*.

Hereby enters this disclaimer to claims 1, 2 and 8 of said patent.

3,835,701.—*John R. B. Murphy*, Kanata Ontario, Canada, and *Edelbert G. Plett*, Belle Mead, N.J. METHOD AND APPARATUS FOR DETERMINING THE THRUST OF A JET ENGINE. Patent dated Sept. 17, 1974. Disclaimer filed July 3, 1975, by the assignee, *Control Data Canada, Ltd.*

Hereby enters this disclaimer to claim 4 of said patent.

3,839,511.—*Shigeo Kishino*, Tokyo, and *Akio Kudamatsu* and *Kozo Shiokawa*, Kanagawa, Japan. O-ETHYL-S-n-PROPYL-O-(SUBSTITUTED PHENYL)-PHOSPHOROTHIOLATES. Patent dated Oct. 1, 1974. Disclaimer filed Aug. 4, 1975, by the assignee, *Bayer Aktiengesellschaft*.

Hereby enters this disclaimer to claims 1, 5 and 8 of said patent.

3,851,959.—*Gerhard Kreutze*, Bammental, *Manfred Moessner*, Eppelheim, *Guenther Obstfelder*, Leimen, *Gerhard Soehring*, *Dossenheim*, and *Victor Pfirrman*, Ludwigshafen, Germany. METHOD AND DEVICE FOR CONTROLLING A MOTION PICTURE PROJECTOR, ESPECIALLY A PROJECTOR FOR TEACHING MACHINES. Patent dated Dec. 3, 1974. Disclaimer filed July 23, 1975, by the assignee, *Badische Anilin- & Soda-Fabrik Aktiengesellschaft*.

Hereby enters this disclaimer to all claims of said patent.

Patents Available for Licensing or Sale

3,174,452. SPORT BRIDGE SELF-CONFORMABLE TO CAMBERED CABIN TOP. Harold C. Rickborn, Rickborn Industries, Inc., 175 Atlantic City Blvd. Rt. 9, Bayville, N.J. 08721.

3,466,092. CHAIRS. Thomas A. R. Virany, 478 De Bryne Cresc., Aylmer, Quebec J9H 5N7, Canada.

3,474,839. DEBARKING MACHINE. Warren Loster, Foster Equipment Co., Inc. Route 1, Box 750, Vinton, La. 70668.

3,591,115. PORTABLE FLASHLIGHT HOLDER. Glenn A. Hibbard, Box A 501 S. Mistletoe, San Jacinto, Calif. 92383.

3,672,172. SIMPLIFIED SUPERCHARGED INTERNAL COMBUSTION ENGINE WITH EMISSIONS CONTROL. Gary L. Hammond, Macomb, Ill. Correspondence to: Neuman, Williams, Anderson & Olson, 77 W. Washington St., Chicago, Ill. 60602.

3,738,701. VELOCIPEDE EQUIPPED WITH DUMP BODY. J. M. Holloway, 311 W. 9th St., Sedalia, Mo.

3,774,352. ALIGNING DEVICE FOR WORKPIECES ON MACHINE TOOL TABLE. Ewald Weber, Coburg, Germany. Correspondence to: Woodhams, Blanchard & Flynn, 2026 Rambling Road, Kalamazoo, Mich. 49008.

3,841,604. BUMPER JACK. Mary B. Haynes, 5322 W. Cambridge, Phoenix, Ariz. 85035.

3,865,426. ARRANGEMENT FOR SECURING SWINGING DOORS OF VEHICLES. Damon L. Barnhart, West Hills Two, Route 7, Frederick, Md. 21701.

3,867,237. PEAR TREE DECORATION. Mrs. Lyle Kearney, R. R. 1, Box 13, Bradley, S. Dak. 57217.

3,874,683. SNOWMOBILE TRAILER. Clarence E. Lawson, 343 Quadra Ave., Rio Linda, Calif. 95673.

3,875,890. SIDE WARNING DEVICE FOR CYCLES. Carl LaCava, 2521 Colorado, Allentown, Pa. 18103.

3,888,254. SANITARY NAPKIN. Laurel A. Hendricks, P.O. Box 943, Palo Alto, Calif. 94302.

3,891,220. COMBINED CARD AND POKER CHIP HOLDER. Anna Driver, 7400 Troon Way, Sacramento, Calif. 95822.

3,892,348. FOLDING CONTAINER. Benedikt Rohner, Assignee: Neher A. G. Switzerland. Correspondence to: Oblon, Fisher, Spivak, McClelland & Maier, Crystal Square Five-Suite 400, 1755 S. Jefferson Davis Highway, Arlington, Va. 22202.

3,896,435. SIMPLE RADAR FOR DETECTING THE PRESENCE RANGE, AND SPEED OF TARGETS. James Constant, RCS Associates, Inc., 1603 Danbury Drive, Claremont, Calif. 91711.

The following 3 patents are offered by: Jan Okonski, 436 E. 2nd, Apt. 6, Tustin, Calif. 92680.

3,193,967. TOY BOAT PROPULSION MEANS.

3,490,233. EXPANDIBLE BULB MOTOR.

3,613,298. TOY BOAT WITH PROPULSION MEANS AND WATER CANNON.

The following 6 patents are offered by: The Dow Chemical Company, 2030 Dow Center, Midland, Mich. 48640.

3,512,216. INJECTION MOLDING NOZZLE SUPPORT.

3,571,856. APPARATUS FOR SIMULTANEOUSLY OPENING VALVES FOR PLURALITY OF INJECTION NOZZLES.

3,606,171. INJECTION NOZZLE OF ADJUSTABLE LENGTH.

3,671,168. LOW HEAT CAPACITY MOLD FOR INJECTION MOLDING.

3,723,585. METHOD OF ELECTROFORMED MOLDS.

3,843,295. INJECTION MOLDING MACHINE WITH ADJUSTABLE NOZZLE LENGTH MEANS.

American Technical Industries, Inc. hereby offers to grant to any person upon written request therefor an unrestricted, non-exclusive royalty-free license for the design, manufacture, assembly and sale in the United States of America of artificial Christmas trees or equipment to be used in the manufacture of artificial Christmas trees under any or all of United States patents listed below. Requests for such licenses should be directed to American Technical Industries, Inc., 29 Elm Avenue, Mount Vernon, N.Y. 10550, Attn. Mrs. Edythe Bloom.

3,223,454. APPARATUS FOR MAKING BRUSHES.

D. 204,887. CHRISTMAS TREE.

3,278,364. ARTIFICIAL CHRISTMAS TREE.

3,365,529. ARTIFICIAL TREE LIMB TAPERING METHOD.

3,458,893. ARTIFICIAL TREE LIMB TAPERING MACHINE.

3,459,243. FULLY AUTOMATIC CROSS-LIMB ATTACHING MACHINE.

3,594,260. ARTIFICIAL SHRUBBERY AND METHOD OF MANUFACTURING THE SAME.

3,665,577. APPARATUS FOR MANUFACTURING ARTIFICIAL SHRUBS.

3,746,601. ARTIFICIAL SHRUB SUITABLE FOR INDOOR OR OUTDOOR USE.

3,811,991. COLLAPSIBLE ARTIFICIAL SHRUB.

General Electric Company is prepared to grant non-exclusive licenses under the following 14 patents on reasonable terms to domestic manufacturers.

Applications for licenses under the following 11 patents may be addressed to: Group Patent Counsel, Major Appliance Park, Louisville, Ky. 40225.

3,721,580. SURFACE TREATMENT POLYMER STRUCTURES.

3,859,932. ADJUSTABLE SHELF ASSEMBLY.

3,870,858. THERMOSTAT MOUNTING.

3,875,681. CONDENSER APPARATUS.

3,876,469. DISH-WASHER VENT SYSTEM.

3,878,266. POLYOLEFIN COMPOSITION RESISTANT TO HOT ALKALINE SOLUTIONS.

3,879,801. HINGE ASSEMBLY FOR A REFRIGERATOR DOOR.

3,880,362. WASTE DISPOSER APPARATUS.

3,880,363. WASTE DISPOSER APPARATUS.

3,885,400. SENSING ARRANGEMENT FOR ICE MAKER.

3,889,697. AERATION DRAIN PLUG FOR DISH-WASHERS.

Application for licenses may be addressed to the General Electric Company, Appliance Components Business Division, 1635 Broadway, Fort Wayne, Ind. 46804. Attn: Patent Counsel.

3,875,511. APPARATUS AND METHOD FOR TESTING DYNAMOELECTRIC MACHINE ROTORS.

3,882,364. INDUCTION MOTOR CONTROL SYSTEM.

Applications for licenses under the following 1 patent may be addressed to: Division Patent Counsel Switchgear Equipment Bus. Div. General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

3,885,113. CONTROL FOR AN ELECTRIC CIRCUIT BREAKER WITH VALVE AND PISTON OPERATING MEANS.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 26 patents.

Inquiries respecting licenses under these patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

3,892,891. PROVISION OF REPRODUCIBLE THIN LAYERS OF SILICON DIOXIDE.

3,892,913. METHOD OF SETTING THE 4.5 MHZ TRAP IN A TELEVISION RECEIVER.

3,892,949. CIRCUIT FOR DETERMINING THE TIME OF TRANSITIONS IN AN ALTERNATING SIGNAL.

3,892,950. AVERAGE VALUE CROSSOVER DETECTOR.

3,892,996. SELF-CONVERGING COLOR TELEVISION DISPLAY SYSTEM.

3,893,112. COMPUTER FOR THRESHOLD OF TAU.

3,893,127. ELECTRON BEAM RECORDING MEDIA.

3,893,159. MULTIPLE CELL HIGH FREQUENCY POWER SEMICONDUCTOR DEVICE HAVING BOND WIRES OF DIFFERING INDUCTANCE FROM CELL TO CELL.

3,893,168. TECHNIQUE FOR MINIMIZING INTERFERENCE IN VIDEO RECORDER REPRODUCER SYSTEMS.

3,893,750. CATHODE-RAY TUBE SCREENING CORRECTION LENS WITH A NON-SOLARIZING MATERIAL.

3,893,869. MEGASONIC CLEANING SYSTEM.

3,894,164. CHEMICAL VAPOR DEPOSITION OF LUMINESCENT FILMS.

3,894,201. SYSTEM FOR DYNAMIC AND STATIC MUTING.

3,894,258. PROXIMITY IMAGE TUBE WITH BELLOWS FOCUSSING STRUCTURE.

3,894,269. HIGH VOLTAGE PROTECTION CIRCUIT.

3,894,285. SPECTRUM DIFFERENTIAL NOISE SQUELCH SYSTEM.

3,894,872. TECHNIQUE FOR FABRICATING HIGH Q MIM CAPACITORS.

3,895,127. METHOD OF SELECTIVELY DEPOSITING GLASS ON SEMICONDUCTOR DEVICES.

3,895,286. ELECTRIC CIRCUIT FOR PROVIDING TEMPERATURE COMPENSATED CURRENT.

3,895,297. APPARATUS FOR NON-DESTRUCTIVELY TESTING A FORWARDLY BIASED TRANSISTOR FOR SECOND BREAKDOWN.

3,895,317. CONTROL CIRCUITS.

3,895,383. RADAR SYSTEM WITH A VERY SHORT PULSE LENGTH.

3,895,429. METHOD OF MAKING A SEMICONDUCTOR DEVICE.

3,896,016. FABRICATION OF LIQUID CRYSTAL DEVICES.

3,896,486. POWER TRANSISTOR HAVING GOOD THERMAL FATIQUE CAPABILITIES.

3,897,281. METHOD FOR EPITAXIALLY GROWING A SEMICONDUCTOR MATERIAL ON A SUBSTRATE FROM THE LIQUID PHASE.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

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DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 10,143. Lossy High Voltage Feed-Thru Capacitor. Filed Mar. 13, 1975. PC $3.25/MF $2.25.

Patent application 556,986. Low Temperature Low Noise SOS Mosfet Amplifier. Filed Mar. 10, 1975. PC $3.25/MF $2.25.

Patent application 561,962. Self-Adjusting Digital Notch Filter. Filed Mar. 25, 1975. PC $3.25/MF $2.25.

Patent application 563,010. Metal-Gas Battery With Axial Reactant Gas Storage Cavity. Filed Mar. 27, 1975. PC $3.25/MF $2.25.

Patent application 566,156. A System for Intermodulation Product Cancellation. Filed Apr. 8, 1975. PC $3.25/MF $2.25.

Patent application 566,158. Fluidic Antiskid Circuit. Filed Apr. 8, 1975. PC $3.25/MF $2.25.

Patent application 566,159. Inverted Heterojunction Photodiode. Filed Apr. 8, 1975. PC $3.25/MF $2.25.

Patent application 566,160. Free Expansion Nozzle for Gas Dynamic Lasers. Filed Apr. 8, 1975. PC $3.25/MF $2.25.

Patent application 566,163. Tethered Balloon Mooring Means. Filed Apr. 8, 1975. PC $3.25/MF $2.25.

Patent application 567,892. Bellcrank Assembly, Nozzle Actuator. Filed Apr. 14, 1975. PC $3.25/MF $2.25.

Patent application 567,893. Equipment Self-Repair by Adaptive Multifunction Modules. Filed Apr. 14, 1975. PC $3.25/MF $2.25.

Patent application 570,063. Pulse Control Apparatus for Plasma Display Selection. Filed Apr. 21, 1975. PC $3.25/MF $2.25.

Patent application 570,065. Resolver-to-Digital Converter. Filed Apr. 21, 1975. PC $3.25/MF $2.25.

Patent application 570,975. Hybrid Sample Data Filter. Filed Apr. 22, 1975. PC $3.25/MF $2.25.

Patent application 570,987. Time Multiplexing Hybrid Sample Data Filter. Filed Apr. 22, 1975. PC $3.25/MF $2.25.

Patent 3,354,214. 5-Lower-Alkyl-10-Phenyl - 5,10 - Dihydrophenophosphazine Compounds. Filed Sept. 15, 1964. Patented Nov. 21, 1967. Not available NTIS.

Patent 3,392,178. Pentafluorophenylorganometallic Compounds of Germanium and Tin. Filed Mar. 31, 1964. Patented July 9, 1968. Not available NTIS.

Patent 3,459,794. 4-Thiol-2,3,5,6-Tetrafluorobenzoic Acid. Filed Jan. 11, 1966. Patented Aug. 5, 1969. Not available NTIS.

Patent 3,536,624. Grease Compositions of Fluorocarbon Polyethers Thickened With Polyfluorophenylene Polymers. Filed May 8, 1968. Patented Oct. 27, 1970. Not available NTIS.

Patent 3,880,550. Outer Seal for First Stage Turbine. Filed Feb. 22, 1974. Patented Apr. 29, 1975. Not available NTIS.

Patent 3,880,638. Thermal Tempering of Non-Oxide Glass Compositions. Filed Dec. 21, 1973. Patented Apr. 29, 1975. Not available NTIS.

Patent 3,881,154. High Resolution, Very Short Pulse, Ino sounder. Filed July 13, 1973. Patented Apr. 29, 1975. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch
General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

Patent application 499,810. Phosphorus, Nitrogen, Bromine Containing Polymers and Process for Producing Flame Retardant Textiles. Filed Aug. 22, 1974. PC $3.25/MF $2.25.

Patent application 506,934. Durable Press Chemical Finishing of Cotton-Blend Textiles by Sublimation Drying. Filed Sept. 17, 1974. PC $3.25/MF $2.25.

Patent application 527,399. Cotton-Tung Oil Durable-Press Textiles With High Flex Abrasion Resistance. Filed Nov. 26, 1974. PC $3.25/MF $2.25.

Patent 3,787,456. N-Benzyl-N-2-Acetoxyethyl-Oleamide. Filed Sept. 13, 1972. Patented Jan. 22, 1974. Not available NTIS.

Patent 3,787,457. N-Ethyl - N - 3-Ethoxypropyl-Oleamides. Filed Sept. 13, 1972. Patented Jan. 22, 1974. Not available NTIS.

Patent 3,801,609. N-Substituted Fatty Acid Amide Lubricants, Filed Sept. 13, 1972. Patented Apr. 9, 1974. Not available NTIS.

Patent 3,803,186. N-Cyclohexyl-N-2-Acetoxyethyl-Oleamide. Filed Sept. 13, 1972. Patented Apr. 9, 1974. Not available NTIS.

Patent 3,808,241. N,N-Bis(2-(3-Carboalkoxypropionyloxy)-Ethyl)-Oleamides. Filed May 7, 1971. Patented Apr. 30, 1974. Not available NTIS.

Patent 3,808,242. N,N-Di-N-Butyl-2-(Oleoyloxy) Propionamide. Filed Sept. 13, 1972. Patented Apr. 30, 1974. Not available NTIS.

Patent 3,821,196. Carbohydrate-Boron Alkoxide Compounds. Filed Oct. 15, 1973. Patented June 28, 1974. Not available NTIS.

Patent 3,833,661. Novel Process for the Preparation of Tris (Hydroxymethyl) Phosphine and Tris(Hydroxymethyl) Phosphine Oxide. Filed July 18, 1972. Patented Sept. 3, 1974. Not available NTIS.

Patent 3,835,182. Dehydroabietic Acid and Ethylene Reaction Products. Filed Sept. 13, 1972. Patented Sept. 10, 1974. Not available NTIS.

Patent 3,847,542. Process for Preparing Frosted and Multicolored Cotton Pile Fabrics. Filed June 1, 1973. Patented Nov. 12, 1974. Not available NTIS.

Patent 3,849,066. Method of Increasing Covering Power of Knitted Cotton Fabric. Filed Sept. 13, 1972. Patented Nov. 19, 1974. Not available NTIS.

Patent 3,854,868. Non-Aqueous Process for Reacting Sultones With Cellulosic Materials and the Product Produced. Filed Nov. 15, 1972. Patented Dec. 17, 1974. Not available NTIS.

Patent 3,854,873. Use of Sodium Bisulfite in an Improved Process for the Treatment of Cellulose Textile Materials With Carbamate Finishing Agents and Sulfurous Acid. Filed Dec. 13, 1972. Patented Dec. 17, 1974. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent 3,875,404. Wide Angle Sun Sensor. Patented April. 1, 1975. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 576,059. Serpentine Charge-Coupled-Device Memory Circuit. Filed May 9, 1975. PC $3.25/MF $2.25.

Patent application 576,504. Inflight Intravenous Bottle Holder. Filed May 12, 1975. PC $3.25/MF $2.25.

Patent application 576,505. Separation Spring Actuator. Filed May 12, 1975. PC $3.25/MF $2.25.

Patent application 577,133. Tone Count Audiometric Computer. Filed May 13, 1975. PC $3.25/MF $2.25.

Patent application 577,972. Low Height VLF Antenna System. Filed May 15, 1975. PC $3.25/MF $2.25.

Patent 3,385,901. Fluorinated Carbinols and Method of Preparing Same. Filed Apr. 6, 1965. Patented May 28, 1968. Not available NTIS.

Patent 3,881,977. Treatment of Graphite Fibers. Filed Nov. 15, 1972. Patented May 6, 1975. Not available NTIS.

Patent 3,883,879. Portable Pantograph C-Scan Recording Flow Detecting System. Filed Aug. 28, 1973. Patented May 13, 1975. Not available NTIS.

Patent 3,884,884. Apparatus for Providing an Aerodynamic Window. Filed May 9, 1974. Patented May 27, 1975. Not available NTIS.

Patent 3,886,337. Templates for Switch Setting in Computer Control. Filed Nov. 7, 1973. Patented May 27, 1975. Not available NTIS.

Patent 3,886,366. Compton Back-Scattered Radiation Source. Filed Apr. 13, 1973. Patented May 27, 1975. Not available NTIS.

Patent 3,886,463. Pulse Width Detector Circuit. Filed May 9, 1974. Patented May 27, 1975. Not available NTIS.

Patent 3,886,478. Multi-Component Flow Injector Pump for a Flowing Gas Laser With Low Output Pressure. Filed Nov. 5, 1973. Patented May 27, 1975. Not available NTIS.

Patent 3,886,551. Video Slope Rate Detector. Filed May 26, 1972. Patented May 27, 1975. Not available NTIS.

Patent 3,886,556. Multichannel Direction Finding Receiver System. Filed Apr. 22, 1963. Patented May 27, 1975. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

Patent application 453,910. Single Bath Fungicidal Chrome-Zirconyl Acetate Mineral Dyeing Process for Cellulosics. Mar. 22, 1974. PC $3.25/MF $2.25.

Patent application 453,913. A Laboratory Apparatus for Treating Cotton and Cotton-Blend Textiles With Organic Solvent Vapors. Filed Mar. 22, 1974. PC $3.25/MF $2.25.

Patent application 461,208. Tretment of Cotton With Glycidyl Methacrylate Using Ionizing Radiation. Filed July 15, 1974. PC $3.25/MF $2.25.

Patent application 467,547. Glycerol Glycoside Esters of Fatty Acids. Filed May 6, 1974. PC $3.25/MF $2.25.

Patent application 468,951. Use of Acidic Hexane to Process Oilseeds for Protein and Oil. Filed May 10, 1974. PC $3.25/MF $2.25.

Patent application 468,952. An Improved Method of Application of THPOH-NH3 Fire Retardant Finish to Textiles. Filed May 10, 1974. PC $3.25/MF $2.25.

Patent application 471,516. Phosphaadamantanes : Synthesis of 2-Thio-1,3,5-Triaza-7-Phosphaadamantane 2,2-Dioxide and Derivatives. Filed May 20, 1974. PC $3.25/MF $2.25.

Patent application 473,477. Quaternary Salts for Hair Cream Rinse Formulation. Filed May 28, 1974. PC $3.25/MF $2.25.

Patent application 476,236. Flame Retardant Textiles by Use of Nitrogenous Type Resin and Antimony Oxide. Filed June 4, 1974. PC $3.25/MF $2.25.

Patent application 476,244. Process for Preparing Multicolored Cotton Pile Fabric. Filed June 4, 1974. PC $3.25/MF $2.25.

Patent application 484,197. Opening and Gripping Mechanism for Automatic Produce-Bagging Machine That Uses Factory Roll Polyethylene Net Tubing. Filed June 28, 1974. PC $3.25/MF $2.25.

Patent application 489,797. Agricultural Foams as Carriers for Activated Charcoal. Filed July 17, 1974. PC $3.25/MF $2.25.

Patent application 495,561. Process for Reducing Agent Migration During Treatment of Knitted Cotton Fabric. Filed Aug. 7, 1974. PC $3.75/MF $2.25.

Patent application 498,150. Carboxymethyl (CM) Cottons Prepared in Non-Aqueous Media. Filed Aug. 16, 1974. PC $3.25/MF $2.25.

Patent application 498,164. Removal of Mercury From Aqueous Solutions Employing Naval Stores Products. Filed Aug. 16, 1974. PC $3.25/MF $2.25.

Patent application 499,688. Electrically Conductive Glasslike Films on Glass or Ceramic Surfaces From Aluminum and Plumbite-Treated Cellulosics. Filed Aug. 22, 1974. PC $3.25/MF $2.25.

Patent application 499,689. Glassy Materials From Plumbites and Cellulosics. Filed Aug. 22, 1974. PC $3.25/MF $2.25.

Patent application 499,693. Color Reversible, Mirror Surface Glassy Materials From Plumbite-Treated Cellulosics. Filed Aug. 22, 1974. PC $3.25/MF $2.25.

Patent application 499,803. Flameproofing Resins for Organic Textiles From Adduct Polymers. Filed Apr. 22, 1974. PC $3.25/MF $2.25.

Patent application 499,804. Flame Resistant Organic Textiles Through Treatment With Phenols and Adduct Polymers. Filed Aug. 22, 1974. PC $3.25/MF $2.25.

Patent application 499,806. Treatment of Organic Textiles With Adduct Polymers and Phenols. Filed Aug. 22, 1974. PC $3.25/MF $2.25.

Patent application 499,807. Phosphorus and Nitrogen Containing Resins for Flameproofing Organic Textiles. Filed Aug. 22, 1974. PC $3.25/MF $2.25.

Patent application 501,412. Method of Fixing Water-Soluble Vinyl Monomers in and on Fibrous Substrates. Filed Aug. 28, 1974. PC $3.75/MF $2.25.

Patent application 501,416. High-Molecular Weight Acidic Polymers. Filed Aug. 28, 1974. PC $3.25/MF $2.25.

Patent application 501,417. Recurable Durable Press Fabric With Soil Release Properties. Filed Aug. 28, 1974. PC $3.75/MF $2.25.

Patent application 501,418. Flame-Resistant Textiles Through Finishing Treatments With Vinyl Monomer Systems. Filed Aug. 28, 1974. PC $3.75/MF $2.25.

Patent application 501,419. Method of Polymerizing and Fixing Carboxyl-Containing Vinyl Monomers in High Conversion on Fibrous Substrates. Filed Aug. 28, 1974. PC $3.75/MF $2.25.

Patent application 501,421. Fixation of Multivalent Metal Salts of Carboxyl-Containing Vinyl Monomers on Fibrous Substrates. Filed Aug. 28, 1974. PC $3.25/MF $2.25.

Patent application 502,241. Alkoxylated Hydroxymethylated Resin Acids and Resin Derivatives as Reactants for Rigid Polyurethane Foams. Filed Aug. 30, 1974. PC $3.75/MF $2.25.

Patent application 504,646. Preparation of Stable Strong Base Cellulosic Anion Exchangers With Red-Ox Potentials. Filed Sept. 9, 1974. PC $3.25/MF $2.25.

Patent application 506,933. Acid Catalyzed Reactive Carbamate Dyestuffs. Filed Sept. 17, 1974. PC $3.25/MF $2.25.

Patent application 509,584. Ultraviolet-Initiated Preparation of N,N-Dibutyl-9(10)-Dibutylphosphono Octadecanamide. Filed Sept. 26, 1974. PC $3.25/MF $2.25.

Patent application 513,361. An Improved Process in the Finishing of Cellulose-Containing Materials by Use of Magnesium Sulfate With N-Methylol Amide Crosslinking Agents and Sulfuric Acid. Filed Oct. 9, 1974. PC $3.25/MF $2.25.

Patent application 529,974. Quaternary Arylaminoalkyl Phosphonium Salts and Process for the Preparation Thereof. Filed Dec. 5, 1974. PC $3.25/MF $2.25.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th St. SW.,
Washington, D.C. 20590

Patent application 590,192. Portable Remote Pilot Terminal. Filed June 25, 1975. PC $3.25/MF $2.25.

Patent application 590,814. Self-Adjusting String Extensometer. Filed June 27, 1975. PC $3.25/MF $2.25.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent application 568,541. Surface Finishing. Filed Apr. 16, 1975. PC $3.75/MF $2.25.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 10,529. Analog-to-Pulse Integrating Converter. Filed Mar. 27, 1975. PC $3.25/MF $2.25.

Patent application 559,860. High Density Armor Piercing Projectile. Filed Mar. 19, 1975. PC $3.25/MF $2.25.

Patent application 559,863. Mirror Steering System. Filed Mar. 19, 1975. PC $3.25/MF $2.25.

Patent application 561,767. Cold Cylinder Assembly for Cryogenic Refrigerator. Filed Mar. 25, 1975. PC $3.25/MF $2.25.

Patent application 561,769. Fiber Optics Connector With Linear X-Y Register. Filed Mar. 25, 1975. PC $3.25/MF $2.25.

Patent application 561,770. Adaptive Gray Scale Control Circuit for Television Video Signals. Filed Mar. 25, 1975. PC $3.25/MF $2.25.

Patent application 563,004. Multipurpose Keyboard System. Filed Mar. 27, 1975. PC $3.25/MF $2.25.

Patent application 563,007. Preparation of Polybenzimidazoles. Filed Mar. 27, 1975. PC $3.25/MF $2.25.

Patent application 563,008. Method for Growing Crystals. Filed Mar. 27, 1975. PC $3.25/MF $2.25.

Patent application 563,252. System for Simulating Missile Target Motion Using Steering Mirrors. Filed Mar. 28, 1975. PC $3.25/MF $2.25.

Patent 3,874,188. Air Cycle Cooling System With Rotary Condensing Dehumidifier. Filed May 9, 1974. Patented Apr. 1, 1975. Not available NTIS.

Patent 3,877,031. Method and Apparatus for Suppressing Grating Lobes in an Electronically Scanned Antenna Array. Filed June 29, 1973. Patented Apr. 8, 1975. Not available NTIS.

Patent 3,878,791. Encapsulated Pellet Igniter Charge. Filed Jan. 17, 1969. Patented Apr. 22, 1975. Not available NTIS.

Patent 3,879,686. Laser System for Producing Variable Duration Short Pulses. Filed Sept. 20, 1973. Patented Apr. 22, 1975. Not available NTIS.

Patent 3,880,527. Annular Beam Radial Scanner. Filed Sept. 23, 1971. Patented Apr. 29, 1975. Not available NTIS.

Patent 3,880,550. Outer Seal for First Stage Turbine. Filed Feb. 22, 1974. Patented Apr. 29, 1975. Not available NTIS.

Patent 3,880,638. Thermal Tempering of Non-Oxide Glass Compositions. Filed Dec. 21, 1973. Patented Apr. 29, 1975. Not available NTIS.

Patent 3,880,723. Method of Making Substrates for Microwave Microstrip Circuits. Filed Aug. 28, 1973. Patented Apr. 29, 1975. Not available NTIS.

Patent 3,881,154. High Resolution, Very Short Pulse, Inosounder. Filed July 13, 1973. Patented Apr. 29, 1975. Not available NTIS.

Patent 3,881,157. Two-Coupler Microwave Frequency Discriminator With Internal Adjustable Delay Line. Filed Mar. 28, 1974. Patented Apr. 29, 1975. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch
General Services Division, Federal Bldg., Agricultural
Research Service, Hyattsville, Md. 20782

Patent application 510,974. A Machine to Fill Insect Rearing Cells With Diet. Filed Oct. 1, 1974. PC $3.25/MF $2.25.

Patent application 527,398. Improved Process for Producing an Edible Cottonseed Protein Concentrate. Filed Nov. 26, 1974. PC $3.25/MF $2.25.

Patent application 529,975. Quaternary Arylaminoalkyl Phosphonium Salts and Process for the Preparation Thereof. Filed Dec. 5, 1974. PC $3.25/MF $2.25.

Patent 3,809,706. N-Substituted Fatty Acid Amide Lubricants. Filed Apr. 6, 1973. Patented May 7, 1974. Not available NTIS.

Patent 3,813,421. Use of Epoxides in the Preparation of Higher Fatty Acid Anhydrides. Filed Mar. 5, 1973. Patented May 28, 1974. Not available NTIS.

Patent 3,819,580. Flame-Resistant Organic Textiles Through Treatment With Halogen Containing Soluble Methylol Phosphine Adducts. Filed Dec. 15, 1972. Patented June 25, 1974. Not available NTIS.

Patent 3,844,824. Process of Treating Fibrous Materials With the Reaction Product of Methylolphosphine Adducts and Nitrogenous Compounds. Filed Nov. 15, 1972. Patented Oct. 29, 1974. Not available NTIS.

Patent 3,846,449. N-Substituted Fatty Acid Amide Lubricants. Filed Apr. 6, 1973. Patented Nov. 5, 1974. Not available NTIS.

Patent 3,849,321. N-Substituted Fatty Acid Amide Lubricants. Filed Apr. 6, 1973. Patented Nov. 19, 1974. Not available NTIS.

Patent 3,849,454. N-Substituted Fatty Acid Amide Lubricants. Filed Apr. 6, 1973. Patented Nov. 19, 1974. Not available NTIS.

Patent 3,854,867. Process for Reacting Sultones With Cellulosic Materials to Produce Cellulosic Materials Having Both Basic and Acidic Groups and Product Produced. Filed Nov. 15, 1972. Patented Dec. 17, 1974. Not available NTIS.

U.S. DEPARTMENT OF NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 473,251. Distributed Temperature Sensor. Filed May 24, 1974. PC $3.25/MF $2.25.

Patent application 487,849. Apparatus for the Generation of A High-Capacity Chirp-Z Transform. Filed July 11, 1974. PC $3.25/MF $2.25.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters,—NASA
Code GP–2, Washington, D.C. 20546

Patent application 565,289. Method and Apparatus for Measuring Web Material Wound on a Reel. Filed Apr. 4, 1975. PC $3.25/MF $2.25.

Patent application 565,290. Telemetry Synchronizer. Filed Apr. 4, 1975. PC $3.75/MF $2.25.

Patent application 574,219. High Resolution Fourier Interferometer-Spectrophotopolarimeter. Filed May 5, 1975. PC $3.75/MF $2.25.

DEPARTMENT OF AGRICULTURE
Chief, Research Agreement & Patent Mgmt. Branch
Federal Bldg., Hyattsville, Md. 20782

Patent 3,835,638. Process for Producing Core Yarn. Sept. 17, 1974. Not available NTIS.

Patent 3,859,121. Formulations for Preparing Long Lasting Insect Repellent Finishes for Textile Fabrics. Jan. 7, 1975. Not available NTIS.

ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 513,210. Liposome-Encapsulated Actinomycin for Cancer Chemotherapy. Filed Oct. 19, 1974. PC $3.25/MF $2.25.

Patent 3,851,527. Maximum Temperature Monitor. Filed Jan. 21, 1974. Patented Dec. 3, 1974. Not available NTIS.

Patent 3,855,003. Thermal Sensing, Fire Safing Device for a Thermal Battery. Filed Jan. 2, 1974. Patented Dec. 17, 1974. Not available NTIS.

Patent 3,856,517. Irradiation Swelling Resistant Alloy for Use in Fast Neutron Reactors. Filed Nov. 26, 1973. Patented Dec. 24, 1974. Not available NTIS.

Patent 3,856,622. High Temperature Nuclear Reactor Fuel. Filed Apr. 18, 1972. Patented Dec. 24, 1974. Not available NTIS.

Patent 3,859,179. Calibration Source Emitting High Energy Beta Particles. Jan. 7, 1975. Not available NTIS.

Patent 3,860,437. Method for Producing Refractory Carbide Coatings on Graphite. Jan. 14, 1975. Not available NTIS.

Patent 3,880,445. Method for Producing Refractory Carbide Coatings on Graphite. Jan. 14, 1975. Not available NTIS.

Patent 3,860,506. Electrophoretic Process for Coating Ceramics. Jan. 14, 1975. Not available NTIS.

Patent 3,862,303. Method for Rapid Detection and Identification of Serological Factors. Jan. 21, 1975. Not available NTIS.

Patent 3,860,482. Reactor Reactivity Control by Coolant Passage Coating. Jan. 14, 1975. Not available NTIS.

DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Arlington, Va. 22217

Patent application 475,696. Low Energy Electric Impact Fuze. Filed June 3, 1974. PC $3.25/MF $2.25.

Patent application 476,958. Rotary Gas Joint. Filed June 6, 1974. PC $3.25/MF $2.25.

Patent application 478,010. Mechanically Initiated Igniter. Filed June 10, 1974. PC $3.25/MF $2.25.

Patent application 478,012. Extraction Rocket. Filed June 10, 1974. PC $3.25/MF $2.25.

Patent application 481,088. Mechanical Heat Flux Recorder. Filed June 20, 1974. PC $3.25/MF $2.25.

Patent application 481,589. Pulsed, Variable Beam Pattern Optical Measuring Device. Filed June 21, 1974. PC $3.25/MF $2.25.

Patent application 482,544. Laser System for Weapons Fire Simulation. Filed June 24, 1974. PC $3.25/MF $2.25.

Patent application 483,862. Particle Vaporizer. Filed June. 27, 1974. PC $3.25/MF $2.25.

Patent application 488,385. Nearly Asymmetric Coupler. Filed July 15, 1974. PC $3.25/MF $2.25.

Patent application 490,433. Wideband, Matched Three-Port Power Divider. Filed July 22, 1974. PC $3.25/MF $2.25.

Patent application 492,110. Electrochemical Preparation of Metallic Tellurides. Filed July 22 ,1974. PC $3.25/MF $2.25.

Patent application 495,473. Integration Gate. Filed Aug. 7, 1974. PC $3.25/MF $2.25.

Patent application 496,419. Poly(Methyl Methacrylate) Pre-Holographic Element. Filed Aug. 12, 1974. PC $3.25/MF $2.25.

Patent application 498,696. Direct Fire Weapons Simulator. Filed Aug. 19, 1974. PC $3.25/MF $2.25.

Patent application 503,017. Variable Energy Explosive Driver. Filed Sept. 3, 1974. PC $3.25/MF $2.25.

Patent application 510,347. Divers Navigation System Display Subsystem. Filed Sept. 30, 1974. PC $3.25/MF $2.25.

Patent application 513,783. Ultrafast Spatially Scanning Laser System. Filed Oct. 10, 1974. PS $3.25/MF $2.25.

Patent application 516,068. Low Viscosity-High Flash Point Ramjet and Turbojet Fuels. Filed Oct. 21, 1974. PC $3.25/MF $2.25.

Patent application 516,221. Continuously Variable, Reversible Optical Filter. Filed Oct. 21, 1974. PC $3.25/MF $2.25.

Patent application 516,291. Product and Process for Protecting Splitline of a Movable Nozzle. Filed Oct. 21, 1974. PC $3.25/MF $2.25.

Patent application 516,858. Cavitating Parametric Underwater Acoustic Source. Filed Oct. 22, 1974. PC $3.25/MF $2.25.

Patent application 520,087. Improved Method of Assembling a Glass Spherical Segment Viewing Port to a Submarine Vessel. Filed Nov. 1, 1974. PC $3.25/MF $2.25.

Patent application 521,312. Non-Saturating Power Switch. Filed Nov. 6, 1974. PC $3.25/MF $2.25.

Patent application 522,388. Optical Component Functional Tester. Filed Nov. 11, 1974. PC $3.25/MF $2.25.

Patent application 522,674. Castable Binder for Cast Plastic-Bonded Explosives. Filed Nov. 11, 1974. PC $3.25/MF $2.25.

Patent application 526,760. Lasing Dye and Method of Preparation. Filed Nov. 25, 1974. PC $3.25/MF $2.25.

Patent application 530,790. Holographic Object Recognition Trainer. Filed Dec. 9, 1974. PC $3.25/MF $2.25.

Patent application 530,916. Novel Inhibitor System for Double-Base Propellant. Filed Dec. 9, 1974. PC $3.25/MF $2.25.

Patent application 531,016. Computer Memory Addressing. Filed Dec. 9, 1974. PC $3.25/MF $2.25.

Patent application 535,068. Dual-End Warhead Initiation System. Filed Dec. 20, 1974. PC $3.25/MF $2.25.

Patent application 535,542. Updated Diver Navigation Device. Filed Dec. 23, 1974. PC $3.25/MF $2.25.

Patent application 538,639. Metal Spray Forming of Waveguide for Phase Shifter Case. Filed Jan. 3, 1975. PC $3.25/MF $2.25.

Patent application 540,461. Underwater Expendable Explosive Link. Filed Jan. 13, 1975. PC $3.25/MF $2.25.

Patent application 540,781. Benthic Bobbing Buoy. Filed Jan. 14, 1975. PC $3.25/MF $2.25.

Patent application 542,151. Lasing Dye. Filed Jan. 20, 1975. PC $3.25/MF $2.25.

Patent application 543,720. Computer Footprint File. Filed Jan. 24, 1975. PC $3.25/MF $2.25.

Patent application 545,249. Non-Functional Magnetic Method of Evaluation Substrate Memory Wire. Filed Jan. 29, 1975. PC $3.25/MF $2.25.

Patent application 563,264. Franz-Keldysh Effect Tuned Laser. Filed Mar. 28, 1975. PC $3.25/MF $2.25.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters
Washington, D.C. 20546.

Patent application 563,049. Accelerometer Telemetry System. Filed Mar. 28, 1975. PC $3.25/MF $2.25.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 30, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-27-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-18-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-17-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-4-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-7-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-4-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-2-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-23-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-3-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-10-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-2-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-6-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—S. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	11-27-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-22-75

Expiration of patents: The patents within the range of numbers indicated below expire during September 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,849,714 to 2,854,668 inclusive
Plant Patents..... Numbers 1,746 to 1,757 inclusive

REISSUES

SEPTEMBER 30, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

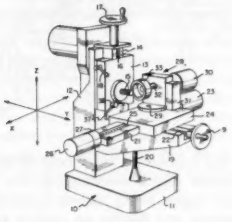
Re. 28,559
METHOD FOR MILLING CAMS FOR SWISS-TYPE SCREW MACHINES

John A. Villano, Cam-Apt, 17 Brown St., Waterbury, Conn. 06702

Reissued No. 3,831,487, dated Aug. 27, 1974, Ser. No. 315,134, Dec. 14, 1972. Division of Ser. No. 104,662, Jan. 7, 1971, Pat. No. 3,714,865. Application for reissue Oct. 23, 1974, Ser. No. 517,291

Int. Cl. B23c *1/18*

U.S. Cl. 90—11 C **1 Claim**



1. In a method for mass producing machine parts using a plurality of Swiss-type screw machines being controlled by cams which are formed by a N/C [milling] *cutting* machine, said [milling] machine comprising a [milling] cutter, a work supporting slide having at least one axis of linear movement relative to said cutter, a rotary table mounted on said slide for supporting a cam blank, linear drive means and rotary drive means for moving said slide and said table, respectively, and said drive means being controlled by a N/C system; [N/C system;] including the steps of analyzing one of said machine parts to determine the profile desired on the cams, preparing a N/C program of linear coordinate information corresponding to the profile desired, supplying said coordinate information to a linear continuous path interpolator, feeding the results from said interpolator to the respective linear and rotary drive means and thereby providing integrated and simultaneous movements of the linear slide and rotary table relative to the [milling] cutter for [forming] *machining* the desired cam, and placing one of said cams into each of said Swiss-type screw machines, whereby one N/C system [effects of control over] *is effective for controlling* a plurality of Swiss-type screw machines.

Re. 28,560
DIAPHRAGM EAR VALVE

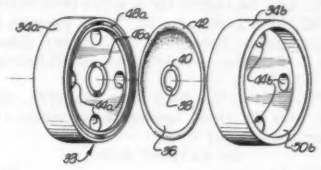
John J. Fling, Malibu, Calif., assignor to Sigma Engineering Company, North Hollywood, Calif.

Original No. 3,730,181, dated May 1, 1973, Ser. No. 122,856, Mar. 10, 1971. Continuation-in-part of Ser. No. 858,600, Sept. 17, 1969, abandoned. Application for reissue Nov. 7, 1973, Ser. No. 413,498

Int. Cl.[2] A61F *11/02*

U.S. Cl. 128—152 **18 Claims**

1. In a sonic ear protector device wherein an ear canal fitting which includes a sound passage conveys sound waves reaching the passage, the combination with said fitting of a sound transmitter coupled with said fitting, the transmitter comprising parallel generally rigid plates spaced apart and a diaphragm between said plates locked around its periphery by said plates, a sound passage aperture through each plate in axial alignment, a sound passage aperture through the diaphragm axially offset from the sound passage apertures through the plates, the diaphragm being laterally spaced from the adjacent plates when reposing in generally flattened condition and the apertures in the plates and diaphragm in conjunction with the space on each side of the diaphragm affording a transmitter sound passage of sinuous configuration in communicating relationship with the sound passage of said fitting, the



diaphragm including a relatively thin flexible membrane and a central annular sealing portion of relatively thicker cross section to provide a ring seal, whereby when said diaphragm is forced against either of said plates by the overpressure of sound waves said sealing portion will bear against the plate against which it is forced and create a seal closing off said transmitter sound passage.

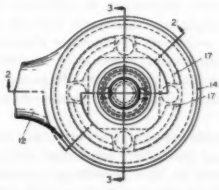
Re. 28,561
REVERSIBLE ONE-WAY CLUTCH

Leonard W. Stephens, Fairview, Pa., assignor to Palmer Filter Equipment Co., Fairview, Pa.

Original No. 3,679,031, dated July 25, 1972, Ser. No. 78,114, Oct. 5, 1970. Application for reissue July 19, 1974, Ser. No. 490,080

Int. Cl. F16d *41/08*

U.S. Cl. 192—44 **15 Claims**



16. A clutch comprising

a body member having an inner annular surface,

drive means for said body member,

shoes having outer surfaces for frictionally engaging said annular surface,

rollers engageable with the ends of said shoes,

a shank having cam means engageable with said rollers,

reversing means comprising a rigid positioning member movable in one direction to engage the shoes and press first ends of the shoes against the rollers and the rollers against the cam means of the shank so that when said drive means rotates the body member in said one direction the shoes are held by the rollers in engagement with the body member, forcing the shoes and shank to rotate, whereas when said drive means rotates the body member in the opposite direction the shoes are not so held,

said rigid positioning member being movable in said opposite direction to engage the shoes and press second ends of the shoes against the rollers and the rollers against the cam

means of the shank so that when said drive means rotates the body member in said opposite direction the shoes are held by the rollers in engagement with the body member forcing the shoes and shank to rotate, whereas when said drive means rotates the body member in said one direction the shoes are not so held,

and actuating means having spring means engageable with the rigid positioning member to move it to its shoe engaging positions.

Re. 28,562

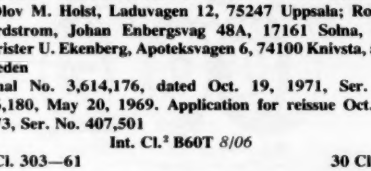
BRAKE CONTROL FOR PREVENTING LOCKING DURING THE BRAKING OF A ROTATING WHEEL

Jan-Olov M. Holst, Laduvagen 12, 75247 Uppsala; Rolf E. Nordstrom, Johan Enbergsvag 48A, 17161 Solna, and Christer U. Ekenberg, Apoteksvagen 6, 74100 Knivsta, all of Sweden

Original No. 3,614,176, dated Oct. 19, 1971, Ser. No. 826,180, May 20, 1969. Application for reissue Oct. 18, 1973, Ser. No. 407,501

Int. Cl.[2] B60T *8/06*

U.S. Cl. 303—61 **30 Claims**



20. In a rotatable wheel and fluid-pressure actuated brake means for braking rotation of the wheel, the combination therewith of control means for preventing the wheel from locking during braking and comprising:

a mass supported for linear oscillating movement in alternate directions from an equilibrium position,

spring means operatively connected with said mass for defining therewith a swinging system and for imposing on said mass force biasing said mass toward said equilibrium position,

said swinging system responding to vibration at a resonant frequency by displacing said mass through more than a predetermined amplitude in alternate directions from the equilibrium position and responding to vibration at any frequency other than said resonant frequency by failing to displace said mass through said predetermined amplitude, and

valve means operable between flow permitting and flow blocking positions and operatively connected with said mass for being maintained in flow permitting position while said mass is in said equilibrium position and with said brake means for responding to displacement of said mass through at least said predetermined amplitude by moving from flow permitting position to flow blocking position and thereby interrupting braking effect exerted on said wheel.

Re. 28,563

METHOD FOR FABRICATION OF PLASTIC FOOTWEAR

Winalee G. Mitchell, and James G. Mitchell, both of 26920 W. River Road, Perrvyburg, Ohio 43551

Original No. 3,238,079, dated Mar. 1, 1966, Ser. No. 236,882, Nov. 13, 1962. Application for reissue Nov. 27, 1973, Ser. No. 419,462

Int. Cl.[2] B32B *31/00;* **A43D** *9/00*

U.S. Cl. 156—252 **34 Claims**

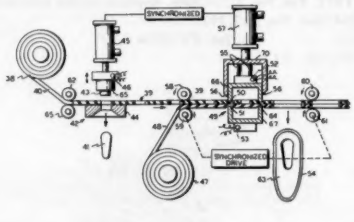
1. A method of manufacturing slippers of heat-sealable synthetic polymeric sheeting material, comprising:

advancing a first elongated strip of said material in a longitudinal direction through a foot-opening forming operation;

forming foot-openings at equally spaced distances along said strip;

subsequently bringing said first strip and a second strip of said material into face to face contact with one another; advancing said first and second strips together through a cutting and sealing operation by pushing said strips toward said operation from one side thereof and pulling or withdrawing said strips from the other side of said operation, said pushing and pulling being performed with equal force, over equal distances and at the same time;

during said cutting and sealing operation, exerting firm



pressure on the exposed faces of both of said strips in at least one narrow region surrounding one of said foot-openings, said region being spaced outwardly from said one foot-opening and having an outline generally conformable to the human foot;

raising the temperature of said strips within said region to the temperature at which said strips will coalesce with one another within said region;

maintaining said temperature until said strips are permanently bonded in said region; and

separating a completed slipper from the material lying outside of said region.

Re. 28,564

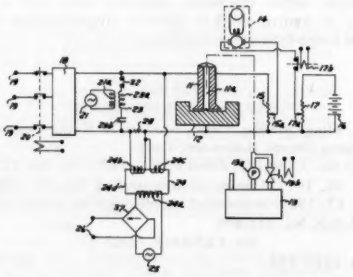
ELECTROCHEMICAL MACHINING APPARATUS AND METHOD

Kiyoshi Inoue, 182, 3-chome, Tamagawayoga, Setagayaku, Tokyo, Japan

Original No. 3,527,686, dated Sept. 8, 1970, Ser. No. 511,827, Dec. 6, 1965. Application for reissue Oct. 12, 1971, Ser. No. 188,470

Int. Cl. B23p *1/02, 1/14*

U.S. Cl. 204—129.2 **13 Claims**



9. In an electrochemical device wherein metal is removed by electrolysis in a process wherein a tool and a workpiece function as electrodes, and the tool is advanced relative to the workpiece at a rate corresponding with the rate of removal of metal from the workpiece to maintain a minute gap between the tool and the workpiece, a power supply for the electrodes and to advance the tool relative to the workpiece, the method of preventing damage to the tool or workpiece from short circuiting and the develop-

ment of a fault current across the gap between the tool and the workpiece which comprises detecting the condition of a momentary drop in current at the electrodes prior to the development of a fault current to detect the imminence of a subsequent current surge as the fault current develops across the gap, and using this detected momentary drop in current at the electrodes to actuate an auxiliary control circuit to cut off the power supply.

Re. 28,565

ADJUSTABLE ACTIVE EQUALIZER

Paul Egon Fleischer, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,715,680, dated Feb. 6, 1973, Ser. No. 167,242, July 29, 1971. Application for reissue July 30, 1974, Ser. No. 493,348

Int. Cl.[2] H03F *1/36*

U.S. Cl. 330—107 **21 Claims**

14. Active RC adjustable loss equalizer apparatus having an input terminal and an output terminal comprising:

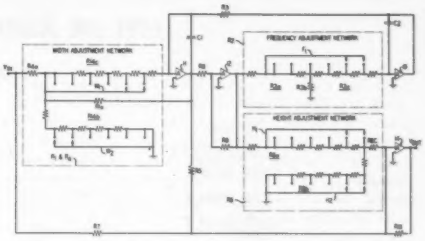
a second feedback amplifier having an input and output, first resistive means connecting said equalizer input terminal to the input and output of said first amplifier, said first resistive means including an adjustable resistive T-network,

a second feedback amplifier having an input and output, said input resistively connected to the output of said first amplifier,

a third feedback amplifier having an input and output, said output resistively connected to the input of said first amplifier,

second resistive means connecting the output of said second amplifier and the input of said third amplifier,

a fourth feedback amplifier having an input and output, said



output connected to said equalizer output terminal,

third resistive means connecting the output of said second amplifier and the input of said fourth amplifier,

and fourth resistive means coupling said equalizer input terminal, and the output of said first amplifier, to the input of said fourth amplifier.

PATENTS

GRANTED SEPTEMBER 30, 1975

ERRATA

For CLASS	See PATENT NO.
100–035	3,908,808
206–550	3,908,852
235–152	3,908,896
250–384	3,908,957
280–011.35 K	3,908,971
279–047	3,909,062
418–257	3,909,158
046–244 R	3,909,276
204–043 R	3,909,404
174–102 P	3,909,555
235–156	3,909,626
215–003.5	3,909,651

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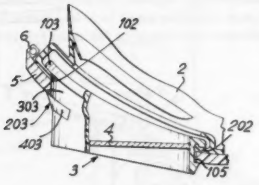
PATENTS

GRANTED SEPTEMBER 30, 1975

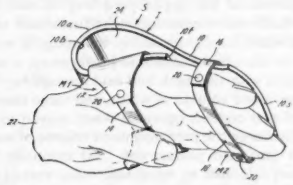
GENERAL AND MECHANICAL

3,908,196
DIVER'S MASK
Luigi Ferraro, 1/D Piazzale Kennedy, Genoa, Italy (16100)
Filed July 16, 1974, Ser. No. 488,925
Int. Cl.[2] A61F *9/02*
U.S. Cl. 2—14 W **5 Claims**



1. A diver's mask comprising a resilient face piece having a rim defining at least one front opening, an annular ridge formed on the periphery of said rim, pane means, a substantially rigid peripheral flange provided on said pane means, an annular groove formed in said peripheral flange for receiving the ridge on said face piece, whereby the pane means is accommodated in the front opening of the face piece, a substantially rigid frame member for securing said pane means to said face piece, and a side wall of said groove forming a part of a cooperating abutment means between said rigid frame member and said rigid peripheral flange providing a snap fit between said frame and said flange, whereby the rim of the face piece is interposed the rigid peripheral flange on the pane means and the rigid frame member, with the annular ridge on the front opening being compressed into water-tight engagement with the annular groove in the peripheral flange.

3,908,197
PROTECTIVE HEAT SHIELD
Paul D. Griffin, P.O. Box 86, Alvin, Tex. 77511
Filed Mar. 13, 1974, Ser. No. 450,662
Int. Cl. A41d *13/00*
U.S. Cl. 2—20 **9 Claims**



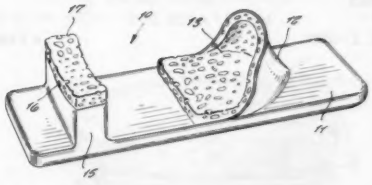
1. A protective shield for protecting the back of a welder's hand from the heat and molten metal of a welding operation, comprising:

flexible insulating means including a flexible, heat protective sheet for mounting with a welder's hand;

mounting means for mounting said protective sheet in a position overlapped upon itself on the back of the hand for forming an air insulation layer protecting the back of the hand from both heat and molten metal and,

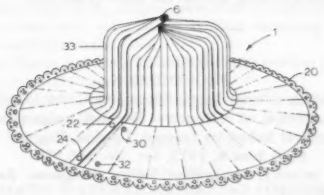
said protective sheet including a protective face which, in said overlapped position, is bent to form an insulating air space with said air insulation layer.

3,908,198
SEAM SKATE FOR CARPETS
William L. Brock, 16051 E. Colfax Ave. No. 10, Aurora, Colo. 80011
Filed Oct. 3, 1974, Ser. No. 511,536
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—24 **3 Claims**



1. A carpet seam skate comprising: a substantially rectangular panel having a first major flat surface, means consisting essentially of a cup defining an opening adapted to receive and support a knee positioned directly on the other major surface of the panel opposite the first major surface with the cup opening oriented primarily towards one end of the panel, and a raised block portion positioned on the same side of the panel as is the cup between the cup opening and the end of the panel towards which the cup is oriented, whereby a worker may readily engage and disengage the seam skate to flatten and merge a carpet seam.

3,908,199
FAN HAT APPARATUS
Chai-Kil Lim, P.O. Box 4305, Honolulu, Hawaii 96813
Filed Aug. 22, 1974, Ser. No. 499,760
Int. Cl.[2] A42B *1/20*
U.S. Cl. 2—175 **9 Claims**



1. Fan hat apparatus comprising:

a plurality of flat bent ribs, the ribs having first central ends and having second outer ends, the ribs being stacked in face to face relationship with upper and lower ribs and intermediate ribs,

a retainer connected to the first central ends of the ribs for joining the ribs in pivotal connection whereby the ribs are connected in stacked relationship and are sequentially turned in radii relationship about the retainer,

flexible elongated binding means sequentially connected to the ribs at said second outer ends for limiting circumferential spacing of the ribs, the connective means having a length sufficient for permitting overlapping of outer ends of an upper rib and a lower rib, flexible sheet means covering an area near the second outer ends and extending toward the first central ends and

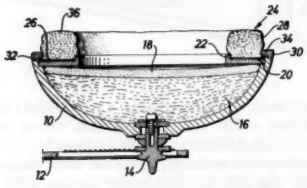
releaseable fastener means connected to an upper surface of a lower rib and to a lower surface of an upper rib for

joining and holding the upper and lower ribs juxtaposed, whereby the remaining ribs are spaced in radii relationship and for releasing the upper and lower ribs whereby the ribs may be stacked for collapsing the fan hat apparatus.

3,908,200
EAR PROTECTING DEVICE

Tord Rune Lundin, Billesholm, Sweden, assignor to Gullfiber AB, Billesholm, Sweden

Filed May 13, 1974, Ser. No. 469,381
Claims priority, application Sweden, May 16, 1973, 73069403
Int. Cl.² A42B 1/06
U.S. Cl. 2—209 **4 Claims**



1. In a hearing protection device of the type having a shell containing a sound absorbing means and having a resilient annular sealing pad means located on the shell circumference for placement over the ear and against the head of a user the improvement in the annular sealing pad resulting in increased damping of sound comprising restraining flange means located on the annular sealing pad, and in contact relationship with the shell, the flange means limiting the deformation of the annular sealing pad in a radial direction sufficiently to provide acoustic rigidity for damping of sound while retaining flexibility of the sealing pad edge portion opposite its base to enable leakage proof bearing against the head of the user.

3,908,201
PROSTHETICS

Michael Edward Benet Jones; Eileen Jones, and Joseph Franciszek Jaworzyn, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

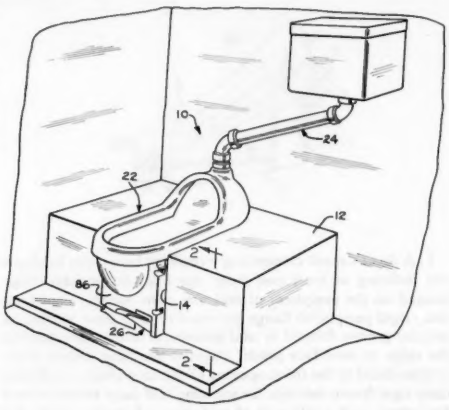
Filed June 8, 1973, Ser. No. 368,199
Claims priority, application United Kingdom, June 30, 1972, 30766/72
Int. Cl.² A61F 1/24, 1/00; C08G 63/18
U.S. Cl. 3—1 **6 Claims**

1. A prosthetic device having a shape suitable for insertion into a human or animal body to replace a part thereof, said device having at least part of the surface thereof made of a plastic, water-stable, nontoxic material having a surface energy in the range 50 erg cm^{-2} to 100 erg cm^{-2} whereby said device is capable of being bonded more strongly to collagenous body tissue than corresponding devices which do not have such a surface energy, said plastic material being a copolymer of poly(ethylene glycol) and bis(β-hydroxylethyl)-terephthalate, the copolymer comprising at least 10 percent by weight of units having the structure $CH_2—CH_2—O—$ and no more than 95 percent by weight of said units and having a reduced viscosity measured on a 1 percent weight/volume solution in o-chlorophenol at 25°C in the range 0.4 $dl.g^{-1}$ to 2.0 $dl.g^{-1}$, wherein said polymeric material being stable in water to the extent that a film of the material 0.5 mm thick which has been immersed in water at 37°C for 24 hours does not break when flexed through 180°.

3,908,202
TOILET

Ronald J. Sargent; Christiaan J. H. Vanden Broek; Arthur W. Henke; James M. Andersen, all of Ann Arbor, Mich.; Benjamin H. Stansbury, Jr., Beverly Hills, Calif.; Stephen H. Kaminski, Burbank, Calif., and Edward Mayer, Los Angeles, Calif., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Apr. 17, 1974, Ser. No. 461,727
Int. Cl.² E03D 9/00
U.S. Cl. 4—10 **11 Claims**



1. An oriental-style toilet in combination with a step-like supporting structure, said toilet being mounted in a recess in said step-like supporting structure with the top edge of the toilet bowl adjacent to the top surface of the step-like supporting structure and the bottom outlet of the bowl adjacent to a discharge outlet in the bottom wall of said recess, said toilet comprising a valve assembly supported on the bottom wall of said recess over said discharge outlet and including a valve element movable between closed and open positions for closing and opening communication with said discharge outlet, a bowl assembly supported on said step-like supporting structure having a bowl with a bottom outlet connected with said valve assembly so that moving of said valve element to an open position will allow discharge of the contents of said bowl into said discharge outlet, said bowl assembly having a passageway adjacent to the upper periphery of said bowl for discharging flush water onto the inner surface of said bowl, and a flush water supply assembly including a water tank mounted at an elevation above said passageway, a conduit in communication with said tank and said passageway for holding a predetermined volume of water, and valve means at the lower end of said conduit operable when moved to an open position to discharge the predetermined volume of water from said conduit into said passageway, and manually operable control means operable to open said valve means and said valve assembly.

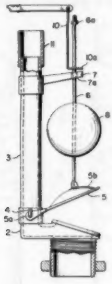
3,908,203
TOILET FLUSH SYSTEM

Miles J. Jackson, 305 Fore Ave., Monroeville, Ala. 36460

Filed Sept. 6, 1974, Ser. No. 503,810
Int. Cl.² E03D 1/34, 5/02
U.S. Cl. 4—67 A **3 Claims**

1. In a two-level flush mechanism for water closet flushing tanks which comprises (A) a holding tank, (B) means for filling this tank with water to a predetermined level, (C) a flush control, (D) means including (D1) a static valve seat and (D2) a moving valve device for rapidly discharging a minor predetermined volume of water from said tank in response to a first mode of actuation of said control, (E) means for rapidly discharging a major predetermined volume of water therefrom

in response to a second mode of actuation of said control, THE IMPROVEMENT CHARACTERIZED BY THE FOLLOWING ELEMENTS AND INTERRELATIONS: FIRST that said moving valve device comprises (*1a*) a lower hinged flat type valving portion co-acting with said valve seat to control the beginning and termination of said discharges, (*1b*) an adjustably fixed upper floater-sinker portion located a preselected amount higher than said valving portion, whereby the difference between said major and minor predetermined volumes is adjustable, an interconnecting portion comprising a stem hingedly affixed to said valving portion, said interconnecting portion joining said upper and lower portions in such relation that said portions rise and fall together; SECOND that the combined weight of said three portions is sufficiently less than their total flotation lift to make the overall buoyancy of



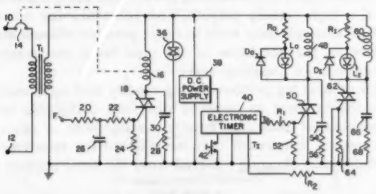
the moving valve device safely positive, whereby the valve is held open in spite of dynamic flow forces when both upper and lower portions are submerged; THIRD that said combined weight is sufficiently greater than the flotation lift of the lower and interconnecting portions to make the overall buoyancy operatively negative when the water level is below said upper portion, whereby said negative buoyancy tends to reclose the valve and terminate the discharge; FOURTH that said flushing control is of the class which holds the valve open as long as it is held actuated by the use, whereby a user can select a minor discharge by actuation of the control in the usual brief-actuation-and-release mode or can select a major discharge by actuating the control and holding it actuated until the discharge has ceased.

3,908,204

ELECTRONIC WATER CLOSET CONTROLLER

Charles L. Hopkins, 86 Beechwood, Shelbyville, Ky. 40065

Filed Sept. 6, 1974, Ser. No. 503,863
Int. Cl.² E03D *13/00*
U.S. Cl. 4—100 **22 Claims**



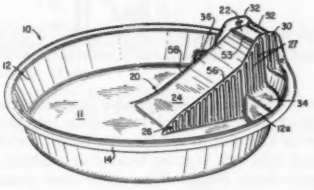
1. An electronically controlled water closet including a bowl, a flush tank, a first solenoid operated valve for draining the flush tank, a second solenoid operated valve for admitting water to refill the flush tank, first electronic switch means for controlling the opening and closing of said first valve, second electronic switch means for controlling the opening and closing of said second valve, electronic timer means for sequencing the operation of said first and second switch means to open said first valve to initiate the flushing cycle, then to close said first valve after a first predetermined time period, then to open said second valve, and then to close said second valve after a second predetermined time period to stop the flushing cycle, and manually operated momentary switch means for starting said timer means to initiate the flushing cycle.

3,908,205

THERMOFORMED WADING POOL WITH INTEGRAL SLIDE AND HAND RAIL

Ascher Chase, Virginia Beach, Va., assignor to General Foam Plastics Corporation, Norfolk, Va.

Filed Sept. 13, 1973, Ser. No. 396,680
Int. Cl.² E04H *3/16, 3/18*
U.S. Cl. 4—172 **4 Claims**



1. In a container structure comprised of a single thermoformed sheet of plastic material having a flat bottom wall of predetermined configuration and circumscribing peripheral side walls of a predetermined height extending upwardly therefrom; a flange at the upper edge of said side walls; and an integral sliding surface sloping upwardly from said bottom wall to a mounting platform therefor spaced well above the said predetermined height of said side walls; the improvement comprising

a. side walls for said slide structure extending from said flat bottom wall to said mounting platform, said side walls being rigidified by heavy vertical ribs;

b. a hollow hand rail on each side of said mounting platform, each of said hand rails including portions integral with said slide side walls and forming upwardly extending extensions thereof;

c. a pair of generally integral horizontal ribs extending along the inner and outer edges of said mounting platform between said hand rails;

d. said flange including an enlarged skirt portion extending between said hand rails;

e. an inverted U-shaped support fastened to inner surfaces of said skirt portion.

3,908,206

AUTOMATIC WATER LEVEL KEEPER FOR SWIMMING POOLS

Chester H. Grewing, 890 Crocker Rd., Sacramento, Calif. 95825

Filed Aug. 28, 1974, Ser. No. 501,344
Int. Cl.² E04H *3/16;* **F16K** *31/18*
U.S. Cl. 4—172.17 **1 Claim**

1. An automatic water level keeper in combination with an above-ground swimming pool having a circumferential wall of predetermined height, said keeper comprising:

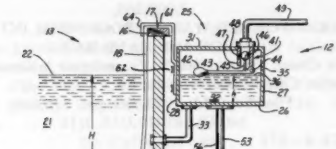
a. a water tank located adjacent the outer periphery of said wall;

b. a float actuated valve mounted on said tank, said valve being so dimensioned as to open and close in response to the presence of water in said tank at a level which is respectively less than and more than a predetermined height;

c. a water hose connected to the supply side of said valve discharging into said tank, said valve opening to permit the discharge of water into said tank when the water level in said tank falls below said predetermined height, and

closing to prevent the discharge of water into said tank when the water level in said tank rises above said predetermined height;

d. pipe means connecting said tank and said pool for equalizing the water level in said tank and said pool;



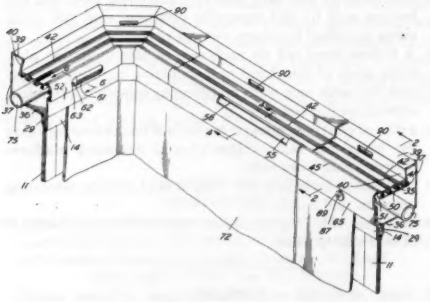
e. a vertically telescoping ground supported standard supporting said tank, said telescoping standard including indicia effective to indicate the height above ground to which said tank is to be located to establish the desired height above ground of the water level of said pool.

3,908,207

RECIRCULATING WATER SUPPLY SYSTEM FOR SWIMMING POOLS

William A. van den Broek, Doylestown, Pa., assignor to KDI Sylvan Pools, Inc., Doylestown, Pa.

Filed June 26, 1973, Ser. No. 373,629
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.17 **4 Claims**



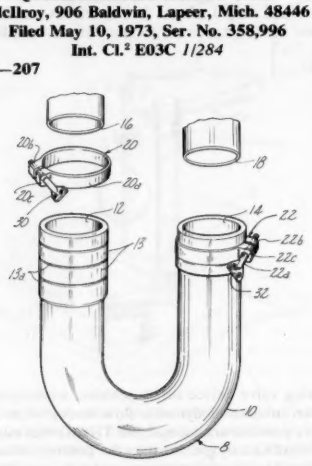
1. A. Recirculating water supply system for swimming pools which comprises an enclosure extending around the perimeter of the pool at the top and having a water supply conduit and a water return conduit, said enclosure being open at the top and including attached vertical wall, handgrip, bottom wall and rear wall, removable cover sections closing the space between said handgrip and said rear wall, said water supply conduit being disposed in said water return conduit, said cover sections being of substantially solid construction with a ribbed upper surface, means for selectively skimming the top surface of the water into said return water conduit at a plurality of predetermined levels, said means including a water take-off member at a first predetermined upper level, a second water take-off member at a second predetermined intermediate level, a third water take-off member at a third predetermined lower level, said second water take-off member being provided with water flow control means, said water flow control means associated with said second water take-off control means being in the closed position for skimming at said first level, said third water take-off member being provided with water flow control means, said water flow control means associated with said third water take-off means being in the closed position for skimming at said first level or at said second level, said first and said third water take-off members being spaced vertically such that the entire surge capacity of the pool can be accommodated therebetween, pump and filter means for delivering water from said water return conduit to said water supply conduit, a collection box exteriorly of said pool, said water return conduit being in communication with said box and said pump being in communication with said box.

3,908,208

QUICK RELEASE SAFETY TRAP

John C. McIlroy, 906 Baldwin, Lapeer, Mich. 48446

Filed May 10, 1973, Ser. No. 358,996
Int. Cl.² E03C *1/284*
U.S. Cl. 4—207 **1 Claim**



1. A quick release trap for use in connection with waste water return plumbing lines, comprising:

an arcuately curved pipe bend portion having a pair of upwardly disposed leg portions sized to receive a corresponding one of a pair of mating downwardly oriented pipes;

each of said leg portions having a plurality of segmented and frangible end portions;

a pair of clamps engageable over individual ones of said segmented end portions for attaching each respective leg portions to the opposed pipe;

a threaded fastener engageable with opposed extending lips from each of said clamps for tightening each clamp about the associated segmented end portion for holding the bend portion tightly attached at both leg portions to the mating pipes;

said bend portion and said leg portions all being constructed of a high density polyethylene substance for admitting light through their walls to make possible a visual inspection of the condition of the pipe bend preparatory to removal for cleaning; and

each of said leg portions being readily and separately detachable from its opposed pipe and deflectible over a substantial distance whereby a water hose or other like cleaning instrument may be inserted for removing and dislodging clogging material from the bend portion.

3,908,209

FLUID DISPENSING APPARATUS

William E. Fillmore, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

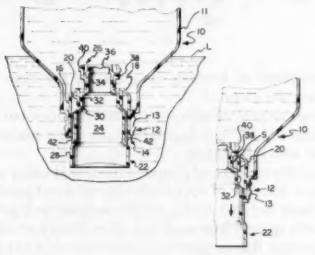
Filed Apr. 15, 1974, Ser. No. 460,946
Int. Cl. E03d *9/02, 9/03*
U.S. Cl. 4—227 **13 Claims**

1. Apparatus for dispensing metered amounts of fluid, which comprises, in combination:

a container for said fluid, said container including a body portion and a neck portion defining an opening into said container;

a stationary guide member secured in said neck and filling the opening in said neck, said guide member including a skirt portion extending into said container, an inwardly extending flange portion integrally formed with the end of said skirt portion, and a sealing wall, attached to the end of said flange portion, extending toward said container opening and defining an opening communicating with the contents of said container;

a movable metering member, slideably engaged in said opening defined by said sealing wall, said movable metering member including a hollow annular portion with a diameter less than the diameter of said skirt portion of said guide member and extending beyond said container opening, a seal portion forming a fluid tight seal with said



sealing wall when said hollow annular portion is moved toward said container opening to a first sealing position, and an extension portion projecting beyond said seal portion and being closed to prevent the contents of said container from entering said movable metering member; and

a sealing ring, carried by said extension portion, said sealing ring forming a fluid tight seal with said sealing wall when said hollow annular portion is moved away from said container opening to a second sealing position, a measured quantity of fluid being trapped between said sealing ring and said seal portion as said hollow annular portion is moved between said first and said second sealing position, said trapped fluid being expelled around said hollow annular portion as said second sealing position is reached.

3,908,210

PIECE OF FURNITURE FOR LYING AND SITTING

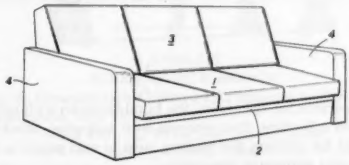
Alfred Alembik, Anastasius-Grungasse 37/9, Vienna 18, Austria

Filed May 29, 1974, Ser. No. 474,159

Claims priority, application Austria, June 6, 1973, 4969/73

Int. Cl.² A47C *17/10, 17/14*

U.S. Cl. 5—29 **17 Claims**



1. A piece of furniture convertible between a lying position and a sitting position and comprising

a frame

a carriage including a pair of telescopingly interfitting carriage members adapted to be moved out of and into said frame for the converstion of the piece of furniture into said lying and sitting positions, respectively,

first and second cushions lying on said carriage one behind the other in said lying position and one over the other in said sitting position,

a wedge-shaped third cushion, which is adapted to form a wedge-shaped bolster in said lying position and a back cushion in said sitting position, and

a support extensible to carry said wedge-shaped bolster in said lying position and comprising two support plate members, which are articulatedly connected and adapted to be folded together to extend upright in said sitting position, one of said support members being connected to said carriage, the other of said support members being guided on said frame.

3,908,211

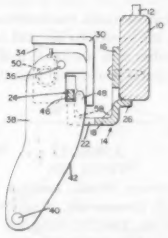
APERTURED GATE SHOE FOR CRIB DROP SIDES

Robert G. Bryant, Gardner, Mass., assignor to Gem Industries, Inc., Gardner, Mass.

Filed Nov. 18, 1974, Ser. No. 524,499

Int. Cl.² A47D *9/00*

U.S. Cl. 5—100 **9 Claims**



1. A double locking gate shoe and trip for a crib having a drop side and a stabilizer bar,

a pivoted trip on the stabilizer bar, a spring for moving the trip forwardly toward the drop side,

a gate shoe on the drop side, the gate shoe including a rearwardly extending apertured member having a terminal rearward upstanding portion also apertured, the two apertures being continuous and leaving a catch bar or the like at the innermost portion of the gate shoe,

said trip including a notch extending inwardly and then at an angle forming a catch, said catch snapping into the aperture of said gate shoe, and being located forwardly of said catch bar in locked position of the drop side, whereby it is necessary to raise the drop side and provide a simultaneous rearward pressure on the trip in order to release the latter from the gate shoe for dropping the drop side.

3,908,212

BUOY WITH ASSOCIATED MOORING ARRANGEMENT

Willem Jan van Heijst, Monte Carlo, Monaco, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed Sept. 24, 1973, Ser. No. 399,956

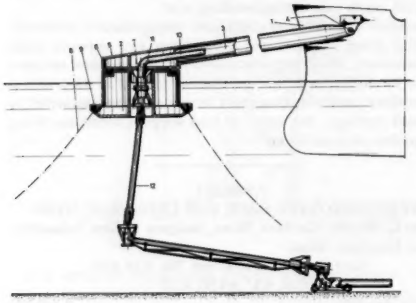
Claims priority, application Netherlands, Sept. 26, 1972, 7212998

Int. Cl.² B63B *21/52*

U.S. Cl. 9—8 P **1 Claim**

1. In combination, a buoy and an associated vessel, means for transferring liquid from the buoy to the vessel for storage in the vessel, a plurality of anchors and anchor chains anchoring the buoy, a turntable, bearings mounting the turntable on the buoy for rotation relative to the buoy about a vertical axis, said bearings interconnecting the turntable and the buoy in

upward and downward directions, an elongated rigid coupling member fixedly secured to the turntable at one end of the coupling member near the buoy and extending laterally away from the buoy, and a horizontal shaft at the other end of the



coupling member remote from the buoy and connecting the coupling member to the vessel for vertical swinging movement of the coupling member and turntable and buoy on and relative to the vessel about a horizontal axis that is fixed relative to the vessel.

3,908,213

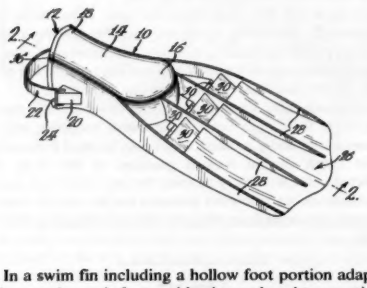
SWIM FIN

James E. Hill, Bremerton, Wash., assignor to Imperial Manufacturing Company, Bremerton, Wash.

Continuation of Ser. No. 280,732, Aug. 14, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 435,895

Int. Cl.² A63B *31/10*

U.S. Cl. 9—309 **4 Claims**



1. In a swim fin including a hollow foot portion adapted to receive a swimmer's foot and having a closed toe portion and an open heel portion, a flexible blade integral with and extending forwardly of said toe portion and strap means extending across the opening at the heel portion and adapted to engage a swimmer's heel to hold the swimmer's foot in the foot portion, the improvement comprising: a hollow toe and instep-receiving insert wedged into said hollow foot portion from the open heel portion thereof, said insert having an exterior surface snugly engaging the interior surface of said hollow foot portion and having an interior cavity with a surface formed of a relatively soft material and engaged with the toe and instep portion of a swimmer's foot, said insert being removable from said hollow foot portion and being replaced with a similar insert having a different size interior cavity whereby a single size swim fin can easily be adapted and sized for different size feet of different swimmers.

3,908,214

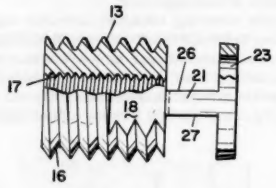
SELF-LOCKING THREADED INSERT AND METHOD OF MAKING SAME

Edward DoLoreto, 10402 Rives Rd., Downey, Calif. 90241

Continuation of Ser. No. 388,304, Aug. 17, 1973. This application Feb. 10, 1975, Ser. No. 548,837

Int. Cl.² B21D *53/24*

U.S. Cl. 10—86 R **4 Claims**



1. A method of forming an insert of the type described comprising the steps of:

forming external threads on a cylindrical member extending to one end thereof, and terminating at a spaced distance from said other end;

counter-boring a fixed distance from said other end;

milling a first pair of oppositely disposed and axially parallel surfaces on said body, which surfaces are substantially equally spaced from said axis, start from said other end at a distance that is slightly greater than said fixed distance, and extend toward said other end, and which surfaces are spaced apart a distance that is slightly less than the diameter of said counter-bore; and

milling a second pair of oppositely disposed flat surfaces which are oriented at right angles to said first pair, and start substantially at the axial position of said first pair, and extend to said other end.

3,908,215

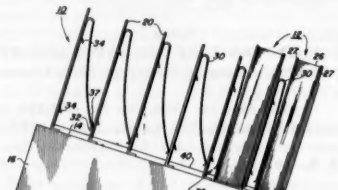
CHESHIRE BINDER COOLING RACK

Donald W. Watson, Arlington Heights, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 428,152

Int. Cl. B42c *19/00*

U.S. Cl. 11—1 R **8 Claims**



1. Apparatus for enhancing the bond between a plurality of pages and a binding strip wherein heat activated adhesive is employed for affixing the binding strip to said pages to form a book, said apparatus comprising:

a thermally conductive plate structure for dissipating heat from said adhesive;

means for supporting said pages and said binding strip on said conductive plate structure and for effecting intimate contact between said pages and said binding strip and for maintaining said pages in a planar orientation; and

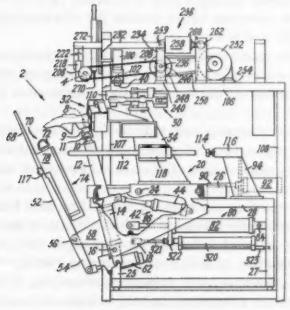
means for supporting said plate whereby a space is provided intermediate said plate and a surface on which said apparatus is supported and whereby said plate is disposed at an angle relative to said surface, said thermally conductive plate comprising a ribbed configuration opposite said surface to thereby enhance heat extraction from said plate.

3,908,216

ROLL WIPERS FOR A SHOE LASTING MACHINE

Ronald O. C. Gadd, Leicester; Sidney H. Payne, Queniborough, and George C. Barton, Leicester, all of England, assignors to USM Corporation, Boston, Mass.

Filed Apr. 10, 1974, Ser. No. 459,694
Int. Cl.[2] A43D *21/00*
U.S. Cl. 12—8.3 **4 Claims**



1. A shoe lasting machine having means for tensioning and wiping a shoe upper inwardly over a last bottom including a pair of driven rolls having helical lands, said rolls extending generally widthwise and being so angularly disposed that the roll surfaces facing the bottom of a shoe on a support generally correspond with the widthwise curvature of the shoe bottom, means for relatively moving said rolls and the support lengthwise of the shoe to wipe the margin of the shoe upper at opposite sides inwardly over the last bottom along selected portions of the shoe, means for mounting said rolls for bodily rocking movement in unison about an axis closely adjacent to and extending lengthwise of the shoe bottom; and, said rolls being individually mounted for rotation on a carrier and the mounting means for each roll being individually adjustable along a plane extending generally heightwise of the shoe bottom to vary the angular disposition of said rolls to suit the widthwise curvature of the shoe bottoms of a variety of shoes.

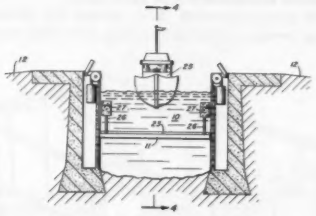
3,908,217

SUBMERGIBLE BRIDGE

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Oct. 22, 1974, Ser. No. 517,038
Int. Cl.[2] E01D *15/02*
U.S. Cl. 14—42 **5 Claims**

1. A bridge comprising, bridge structure support means, bridge means mounted in said support means to be lowered beneath the surface of the water for a vessel to pass over said bridge, side rail means carried by each side of said bridge means and movable between an erect and flat condition relative to said bridge, and side rail activating means connected to each side rail to cause said side rails to lie flat on said bridge when said bridge is submerged and to be raised erect when



said bridge is elevated above the surface of the water over which the bridge is constructed.

3,908,218

CLEANING PAD

Kazuko Oishi, 2308 W. Victoria Ave., Montebello, Calif. 90640

Continuation-in-part of Ser. No. 278,006, Aug. 4, 1972, abandoned. This application Jan. 4, 1974, Ser. No. 430,714
Int. Cl.[2] A47L *17/08*
U.S. Cl. 15—209 R **6 Claims**

3. A cleaning pad, comprising:

an exterior bag composed of a loosely woven plastics textile material adapted for free passage of water therethrough, a resilient filler snugly fitted into and at least slightly stretching said bag, composed of a sheet of openwork, relatively stiff and resilient plastics net arranged into a compact multilayered bag-conforming configuration including a succession of intimately facially contacting fold layers integrally joined at adjacent uncreased edges which resiliently resist compressive deformation of the layers at the marginal bends between fold layers and which resiliently bias said pad to expand within and tauten said bag.

3,908,219

WALK ABOUT WASHING APPARATUS

Paul W. Chapman, Rt. 2, Ozark, Mo. 65721; Richard M. Graves, 1821 N.E. Schuyler, Portland, Oreg. 97212, and Henry C. Sasse, III, 6595 S.W. Lombard, Beaverton, Oreg. 97005

Filed Feb. 8, 1974, Ser. No. 440,849
Int. Cl.[2] B60S *3/06*
U.S. Cl. 15—21 D **10 Claims**

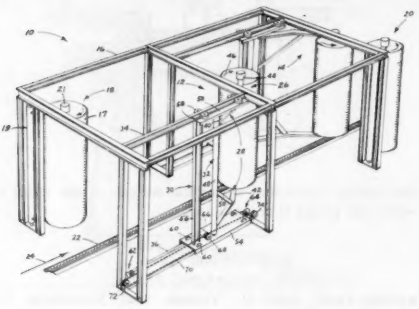
1. In apparatus for washing an article, such as a vehicle or the like, which article moves in the apparatus in a given direction along a path,

a washing implement for engaging different upright sides of such an article as the same travels along said path,

means mounting said implement for limited compound horizontal movement relative to said path, said mounting means comprising a swing arm structure supporting said implement for reversible horizontal swinging of the implement toward and away from said path, such swinging resulting from engagement of the implement with an article moving along the path, and carriage means for said

swing arm structure accommodating reversible horizontal translation of the implement along a line substantially paralleling said path, such swinging and translation being producible independently of each other,

reversible power-operated drive means for driving said carriage means and producing said reversible translation



in accordance with the angular position of said swing arm structure relative to said path, and

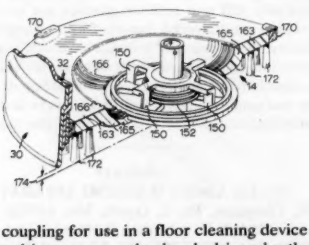
sensor means mounted on said carriage means and operatively coupled to said drive means for sensing said angular position and, in accordance therewith, for instructing said drive means as to which direction to drive said carriage means.

3,908,220

APPARATUS FOR SCRUBBING RUGS, FLOORS AND THE LIKE

Gerald James Adamson, Scarborough, and James K. O'Grady, Toronto, both of Canada, assignors to The Filter Queen Corporation Limited, Toronto, Canada

Division of Ser. No. 257,038, May 25, 1972, Pat. No. 3,849,823.
Filed Apr. 22, 1974, Ser. No. 462,707
Int. Cl.[2] A47L *11/03, 11/162*
U.S. Cl. 15—50 R **2 Claims**



1. A drive coupling for use in a floor cleaning device of the type having a drive means and a brush driven by the drive means within a skirt such that soap solutions can be dispensed from a reservoir above the skirt to be used on the brush for cleaning a floor covering, the drive coupling comprising:

an inner element adapted to be operably coupled to the drive means;

an outer element adapted to be coupled to the brush with the inner and outer elements disposed about an axis and spaced axially;

straps extending generally axially and attached at respective first ends thereof to the inner element and at respective other ends thereof to the second element; and

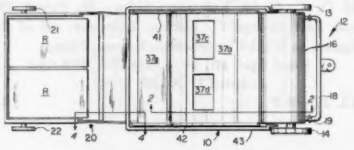
spring means biasing the outer element axially away from the inner element so that in use the brush bristles project beyond the skirt such that when the brush encounters a relatively high resistance to rotation, the straps move towards a horizontal position, the spring means is further stressed, and the brush moves upwardly so that the skirt contacts the floor covering and the brush resistance is reduced whereby brush stalling is substantially obviated.

3,908,221

LAWN SWEEPER AND TRAILER

Daniel E. Wolfe, 344 W. Baltimore St., Greencastle, Pa. 17225

Filed Aug. 6, 1973, Ser. No. 385,918
Int. Cl.[2] E01H *1/05*
U.S. Cl. 15—79 **10 Claims**



1. A lawn sweeper and articulated vehicle comprising:

a lawn sweeper having a pair of laterally spaced wheels and rotatable sweeper brush means for discharging material upwardly and toward said vehicle,

said vehicle receiving debris discharged by said sweeper and including a platform having a pair of support wheels, said platform being adapted to support removable receptacle means,

means for connecting said vehicle to said sweeper for articulation on a vertical axis located substantially on the vertical median plane of each of said sweeper and vehicle, and

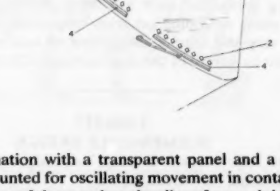
means for guiding material discharged by said brush means to said platform when said vehicle is not in line with said sweeper as said vehicle articulates on said connecting means relative to said sweeper during turning movement of said sweeper and vehicle, comprising flexible side guide means connected to said vehicle and said sweeper.

3,908,222

WINDSHIELD WIPER SAVERS

Gordon Robert Scott, 2568 S. Delaware St., Denver, Colo. 12699

Filed Mar. 25, 1974, Ser. No. 454,111
Int. Cl.[2] B60S *1/02*
U.S. Cl. 15—250 **1 Claim**



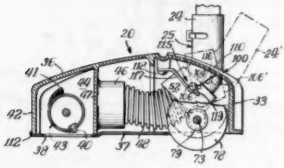
1. In combination with a transparent panel and a flexible wiper blade mounted for oscillating movement in contact with the outer surface of the panel, a plurality of spaced, independent units permanently mounted on the outer surface of said panel, said units being positioned parallel to each other in a row and located within the extreme points of the oscillation of said wiper blade for causing the edge of said wiper blade to flex as said blade passes thereover to remove ice, snow, and dirt therefrom, said units being diamond shaped and having opposite points thereof pointed in the direction of oscillation of the wiper blade.

3,908,223

CLEANING NOZZLE ATTACHMENT FOR A SUCTION CLEANER

Joseph F. Brooks, Bloomington, and Robert B. Meyer, Normal, both of Ill., assignors to National Union Electric Corporation, Greenwich, Conn.

Division of Ser. No. 268,126, June 30, 1972, Pat. No. 3,815,170. This application Jan. 11, 1974, Ser. No. 432,679
Int. Cl.[2] A47L 9/04
U.S. Cl. 15—383 11 Claims



1. In a rug and carpet cleaning nozzle attachment adapted to be connected to a source of vacuum and to be manipulated over a rug or carpet to be cleaned by at least one tubular wand, said attachment including a nozzle body having front and rear ends etending generally transversely to the axis of said wand and an underside having a suction opening therein, said nozzle body also having a socket member movably mounted therein adjacent to said rear end and a tubular portion adapted to receive one end of said wand, and at least one wheel rotatably carried by said socket member and adapted to roll on a rug or carpet to be cleaned when said attachment is in use, the improvement comprising mechanism for extending said wheel to a predetermined lowered position below the underside of said nozzle body in response to movement of the tubular portion of said socket member to an upright position with respect to said body, whereby the rear end of said body is elevated and said body is supported in a stable condition on said rug or carpet by said wheel and the front end of said body.

11. The attachment of claim 1, further characterized in that said nozzle body has a chamber therein communicating with said suction opening, a brush roll having a plurality of radially outwardly extending bristles thereon is rotatably mounted in said chamber and operable when driven to agitate the surface of a rug or carpet underlying said suction opening, and said wheel extending means is effective to elevate said nozzle body sufficiently so as to prevent said bristles from contacting the surface of said rug or carpet when said socket member is in said upright position.

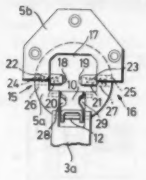
3,908,224

LOCKABLE FURNITURE HINGE

Theodor Vitt, Porz-Eil, Germany, assignor to Prameta Prazisionsmetall und Kunststofferzeugnisse G. Baumann & Co., Cologne, Germany

Filed Nov. 20, 1974, Ser. No. 525,458
Claims priority, application Germany, Nov. 29, 1973, 2359534
Int. Cl.[2] B14C 29/00
U.S. Cl. 16—164 10 Claims

1. A hinge comprising a pair of hinge elements, a pair of connecting rods having first and second opposite ends, first pivot means for connecting first ends of said rods to a first of said hinge elements, second pivot means for connecting second ends of said rods to a second of said hinge elements, said connecting rods and first and second pivot means being constructed and arranged for providing relative movement of said pair of hinge elements between a first adjacent position and a second more remote position, and means carried by one of said hinge elements for lockingly engaging one of said connecting rods to releasably retain said hinge elements in said first adjacent position.

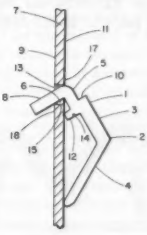


3,908,225

UTILITY HANDLE

Joseph C. Drilling, and Lary D. Jones, both of Lexington, Ky., assignors to Square D Company, Park Ridge, Ill.

Filed May 13, 1974, Ser. No. 469,155
Int. Cl.[2] A47B 95/02
U.S. Cl. 16—124 8 Claims



1. A unitary handle for rigid attachment to a wall structure, comprising hand grasp means, a tongue portion joined to and projecting from said hand grasp means for attaching engagement in a receiving slot through said wall structure, said tongue portion being an integral web having lateral and longitudinal dimensions substantially corresponding to the lateral and longitudinal dimensions of said slot through which said tongue portion is received, a flange integrally joined to said tongue portion and depending therefrom in a first direction parallel to a rear surface portion of said wall structure and abutting there-against when said tongue portion is seated for attachment in said slot, a shoulder integrally joined to said tongue portion and extending therefrom in an opposite second direction at a point spaced apart from said flange and parallel to a front surface portion of said wall structure to abut thereagainst when said tongue portion is seated for attachment in said slot, and wedge means associated with said tongue portion to securely wedge and rigidly hold said tongue portion in said slot.

3,908,226

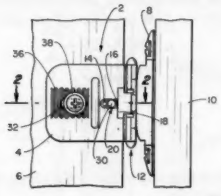
EASILY MOUNTED ADJUSTABLE HINGE

George D. Read, Glendora, and Howard B. Gorton, San Gabriel, both of Calif., assignors to Ajax Hardware Corporation, City of Industry, Calif.

Filed May 24, 1974, Ser. No. 473,143
Int. Cl.[2] E05D 7/04
U.S. Cl. 16—130 15 Claims

1. In an adjustable hinge construction for cabinets and associated cabinet doors, the combination of: a door leaf and a stile leaf, said leaves being interconnected through a hinge pin, said door leaf having a first elongate slot and a captively associated retaining member having an extending portion

adapted to be received in a retaining recess in a door to which the hinge is secured and to permit selected lateral movement of said door leaf in relation to said door, a second elongate slot adapted to receive a securement means to rigidly secure said



door leaf to said door in a selected lateral position, said second elongate slot having a plurality of gripping means contiguous thereto for forming gripping surfaces for retention of said securement means.

3,908,227

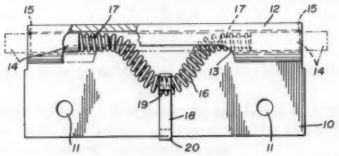
HINGE STRUCTURE

James F. Cain, Youngstown, Ohio, assignor to Marlboro Manufacturing Inc., Alliance, Ohio

Filed Mar. 22, 1974, Ser. No. 454,013

Int. Cl.[2] E05D *11/00*

U.S. Cl. 16—137 **7 Claims**



1. A hinge structure for mounting a door in a doorway comprising an elongated mounting frame secured in said doorway, an elongated arcuate knuckle on said mounting frame, a plurality of cut out sections in said knuckle, a hinge leaf for each of said cut out sections, each hinge leaf being secured to the edge of a door, an elongated arcuate secondary knuckle on said hinge leaf of substantially the same cross sectional configuration as said first mentioned knuckle, a cut away section in said secondary knuckle inwardly of the ends thereof, a pair of pintles movable longitudinally within said secondary knuckle on either side of said cut away section thereof, a spring positioned between said pintles normally urging said pintles outwardly of the ends of said secondary knuckle and means on said hinge leaf temporarily engaging and holding said pintles and spring against movement in said secondary knuckle so as to temporarily prevent said spring from moving said pintles outwardly of said secondary knuckle and into engagement with said first mentioned knuckle.

3,908,228

SELF-CLOSING HINGE

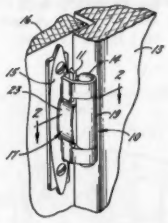
John I. Newcomer, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Dec. 20, 1974, Ser. No. 534,738

Int. Cl.[2] E05D *1/12*

U.S. Cl. 16—180 **2 Claims**

1. A self-closing hinge having first and second pivotally connected parts, a plastic, block-like plunger supported on said first part and engageable with said second part, a hole opening out of one side of said plunger and having a closed bottom located adjacent the opposite side of the plunger, and a coil spring telescoped into said hole and compressed between said first part and the bottom of said hole, the improvement in said hinge comprising, a post molded integrally with and projecting from the bottom of said hole and telescoped



into said spring to help retain the latter within said hole in the event a third side of said plunger breaks and creates an opening leading into said hole.

3,908,229

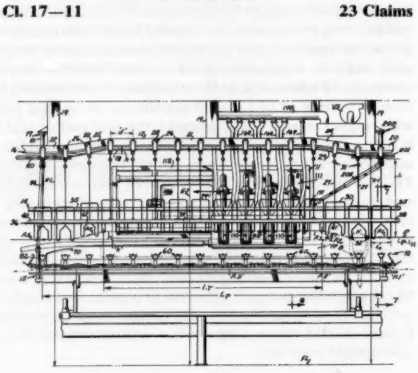
VACUUM EVISCERATOR APPARATUS AND METHOD

Grover S. Harben, Jr., Gainesville, and Kenneth Z. Graham, Dawsonville, both of Ga., assignors to Gainesville Machine Co., Inc., Gainesville, Ga.

Filed Jan. 12, 1972, Ser. No. 217,206

Int. Cl. A22b *3/08*

U.S. Cl. 17—11 **23 Claims**



1. Poultry processing apparatus for positioning poultry having an access opening to the body cavity thereof at its vent including:

conveying means for successively moving the poultry along a prescribed path in a head lowermost position, said conveying means including a hock engaging member for supporting the poultry by their hocks; and,

positioning means including a holding member for engaging the poultry in the access opening in opposition to said hock engaging member to support the poultry between said holding member and said hock engaging member so that the access opening is located in a relatively fixed plane while the breast portion of the poultry is supported solely through its bone and muscle structure to allow the breast portion of the poultry to move with respect to said plane.

3,908,230

PROCESS AND APPARATUS FOR FILLETING FISH

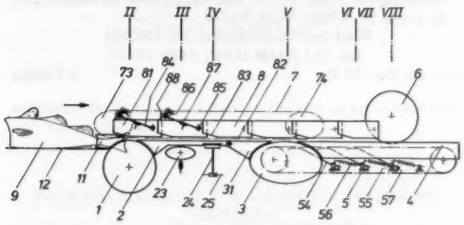
Franz Hartmann, Bad Oldesloe, Germany, assignor to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany

Filed Apr. 1, 1974, Ser. No. 457,086

Claims priority, application Germany, Apr. 4, 1973, 2316791

Int. Cl.[2] A22C *25/16*

U.S. Cl. 17—57 7 Claims



3. A machine for filleting fish comprising means for transporting fish successively past a plurality of processing stations for performing an automatic filleting operation, a pair of belly knives at one of said stations for separating the belly spines from the flesh between the belly cavity and the tail of said fish, thereby exposing said belly spines, a pair of rib knives at a subsequent station, and a sensing element adapted to control at least part of the operation of the rib knives by sensing the presence and/or absence of the exposed belly spines as the fish are transported past said sensing element, to confine operation of said rib knives to the belly cavity region of the fish.

3,908,231

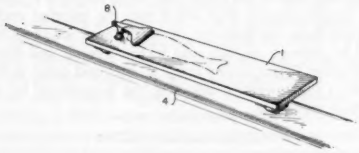
FILLET BOARD

James A. Price, 1401 Crestwood, and Vol W. Sharp, 1663 Old Wire Rd., both of Fayetteville, Ark. 72701

Filed June 11, 1974, Ser. No. 478,376

Int. Cl.[2] A22C *25/06*

U.S. Cl. 17—70 3 Claims



1. A fillet board having substantially flat upper and lower surfaces, the lower surface containing a pair of U-shaped female brackets, said brackets being spaced apart from each other and offset from the medial axis of the board, and a pair of U-shaped male brackets which are adapted to be mounted on the gunnel of a boat and engage said female brackets, each of said U-shaped male brackets provided with two hook-shaped arms, one of said arms being adapted to engage one of said female brackets while the other arm acts as a support for the fillet board, either arm of each of the male brackets being capable of being inserted into the female bracket with the other arm acting as a support for the fillet board, said fillet board extending either external or internal to the gunnel of the boat depending upon with which arm of the male bracket the female bracket is engaged.

3,908,232

TOW CONVERTER

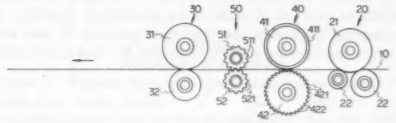
Katsumi Okayama, Daito; Makoto Mizutani, Osaka, and Saburo Sato, Ibsragi, all of Japan, assignors to Kansai Kiko Co., Ltd., Osaka, Japan

Filed Mar. 19, 1974, Ser. No. 452,657

Claims priority, application Japan, Mar. 22, 1973, 48-33307

Int. Cl.[2] D01G *1/10*

U.S. Cl. 19—.56 3 Claims



1. A converter for stretching and breaking a tow to manufacture a sliver utilizing a cutting roller system between a back nip roller system and a front nip roller system, said cutting roller system comprising an anvil roller and a cutter roller, said cutter roller being located opposite to and below the anvil roller with a slight space being disposed therebetween, projected threads wound in a spiral shape on the surface of the anvil roller and extending a distance therefrom, a plurality of cutting edges mounted on the surface of the cutter roller at angles of 0° to 20° with respect to the axis of the cutter roller, said cutting edges being twisted in a direction opposite to the direction along which the projected threads of the anvil roller are wound, the edge points of the cutting edges being directed in the rotating direction of the cutter roller, means for rotating the cutter roller of the cutting roller system several times faster, in surface peripheral speed, than the anvil roller and the back nip roller system, a debonder roller system placed between the cutting roller system and the front nip roller system, the debonder roller system comprising a top roller and a bottom roller which rotate to engage each other with a slight space disposed therebetween, undercut channels cut on the surface of the bottom roller at angles of 5° to 45° with respect to the axial direction of the roller, said channels being twisted in the same direction as the twist direction of the cutting edges of the cutter roller, undercut channels cut on the surface of the top roller at the same angles as those of the undercut channels of the bottom roller and being twisted in a direction opposite to the direction of the undercut channel thereof, and means for rotating the top roller and the bottom roller of the debonder roller means at the same surface peripheral speed, both of said rollers being rotated faster in surface peripheral speed than the back nip roller system, and slower than the front nip roller system.

3,908,233

RELEASABLE ONE-PIECE CABLE TIE

Jack E. Caveney, Chicago, and Roy A. Moody, Flossmoor, both of Ill., assignors to Panduit Corporation, Tinley Park, Ill.

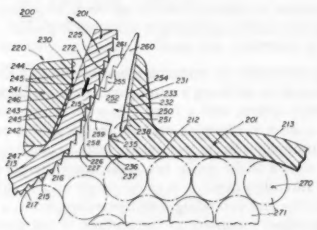
Filed July 3, 1969, Ser. No. 838,908

Int. Cl.[2] B65D *63/00*

U.S. Cl. 24—16 PB 14 Claims

1. A releasable integral one-piece cable tie to be tensioned about a bundle of wires and the like, said cable tie comprising an elongated flexible strap, a row of teeth disposed on one longitudinal surface of said strap and arranged transversely with respect thereto, a frame integral with one end of said strap and including an abutment wall and an end wall, said frame having an entry surface and an exit surface and a strap-receiving opening extending therethrough, a rigid ledge on said end wall extending longitudinally therefrom toward said abutment wall, a pawl disposed within said frame in said strap-receiving opening and hingedly mounted on said ledge, the longitudinal extent of said pawl at its juncture with said ledge being less than the longitudinal extent of said ledge, said

abutment wall having a strap-bearing surface disposed toward said pawl and defining therewith a strap-receiving throat, at set of teeth on said pawl arranged transversely with respect thereto and disposed toward said abutment wall and shaped to engage said row of teeth on said strap, said strap being deformable into a loop encircling a bundle of wires with the free end of said strap extending into said strap-receiving throat and through the opening in said frame and therebeyond, said set of teeth being disposed toward said row of teeth as said strap is tensioned about the bundle of wires to a tensioned condition and release of said strap causing at least certain ones of said row of teeth firmly to engage said set of teeth, a plurality of the teeth in said set of teeth being positioned opposite said strap-bearing surface in the tensioned position of said strap with said strap-bearing surface extending beyond said plurality



of teeth toward both said entry surface and said exit surface thereby to encompass said plurality of teeth, any force tending to withdraw said strap from within said strap-receiving throat in a strap-loosening direction serving to move said set of teeth into more firm engagement with the engaged ones of said row of teeth firmly to grip said strap between said strap-bearing surface and said pawl, whereby to prevent inadvertent withdrawal of said strap from said frame and thus to lock said strap in its tensioned condition about the bundle of wires, and an extension on said pawl extending beyond said exit surface in all positions of said pawl for engagement by a user to move said pawl from the tensioned condition thereof to a release condition, said set of teeth in the release condition of said pawl being out of engagement with said row of teeth, thereby to allow withdrawal of said strap from said frame.

3,908,234

CLOSURE CLIP

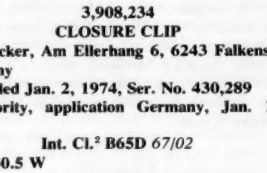
Herbert Niedecker, Am Ellerhang 6, 6243 Falkenstein, Taunus, Germany

Filed Jan. 2, 1974, Ser. No. 430,289

Claims priority, application Germany, Jan. 10, 1973, 2300980

Int. Cl.[2] B65D *67/02*

U.S. Cl. 24—30.5 W **1 Claim**



1. A generally U-shaped closure clip opened at one end thereof and adapted upon closure to form a tight spiral with the ends overlapping slightly in adjacent planes, said clip having a first arm and a second arm joined by an arcuate web, the main parts of said arms adjacent to the arcuate web being arced in the same direction like parts of concentric circles and the free ends of said arms being bent toward one another, the first arm being longer than the second arm and having a greater radius of curvature than the radius of curvature of said second arm.

3,908,235

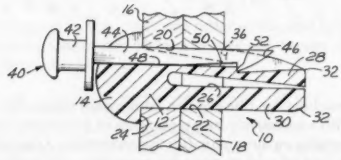
REMOVABLE SNAP FASTENER

Gregory Alan Telliard, 12380 Crestwood Drive, Yucaipa, Calif. 92399; David Michael Hamilton, 18573-13th St., Bloomington, Calif. 92316, and Gary Edward Chaplin, 295 E. Ceres St., Rialto, Calif. 92376

Filed Dec. 2, 1974, Ser. No. 528,921

Int. Cl.[2] A44B *21/00;* **F16B** *19/00*

U.S. Cl. 24—73 P **6 Claims**



1. A releasable snap-fastener for securing two members together, at least one of said members having a hole provided through which the fastener is inserted, said snap-fastener comprising an elongated, resilient shank having a diametral slot formed in one end thereof and extending for a substantial portion of the length thereof, said slot dividing said shank into two parallel fingers, one of said fingers being smooth-sided, and the other finger having a catch formed thereon which is adapted to engage the marginal edge of said hole in said one member, said other finger being bent toward said one finger when the shank is inserted through said hole, and said catch springing laterally outward to engage the marginal edge of said one member when the shank is inserted all the way into said hole; said other finger having a longitudinally extending groove formed in the outer side thereof, with an inclined ramp adjacent said catch, said groove extending from one end of said snap-fastener to the other and being adapted to receive a long, slender release tool which may be inserted endwise into the slot from the front end of the fastener, said tool being adapted to slidingly engage said inclined ramp and thereby cam said other finger downwardly, so that said catch is disengaged from said member, allowing the fastener to be withdrawn from said hole.

3,908,236

TUFTING BUTTON

Stephan C. Shepherd, Winnetka, Ill., assignor to Maxant Button & Supply Co., Chicago, Ill.

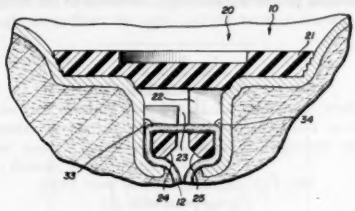
Filed Apr. 29, 1974, Ser. No. 464,815

Int. Cl.[2] A47C *27/00;* **A44B** *1/18*

U.S. Cl. 24—90 B **12 Claims**

1. A tufting button having a head portion and a shank portion, there being a first slot extending longitudinally through said shank portion from the free end thereof, there being a second slot extending longitudinally through said shank portion, said second slot being angularly displaced with respect to said first slot and being closed at the free end of said shank portion, there being a pair of generally horizontal slots extending in opposite directions through said shank portion from the respective edges of said first slot to said second slot, whereby

the button can be secured to a tufting cord by extending the tufting cord through the first slot and by rotating the button

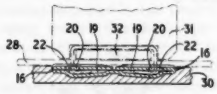


to extend the tufting cord through the pair of horizontal slots into the second slot.

3,908,237
BACKING MEMBERS FOR GARMENT FASTENING DEVICES

Adrian Robert Cruse, 39 St. Paul's Square, Birmingham, England

Filed June 19, 1972, Ser. No. 263,812
Claims priority, application United Kingdom, June 21, 1971, 29037/71
Int. Cl.[2] A44B *1/42, 13/00*
U.S. Cl. 24—95 **3 Claims**

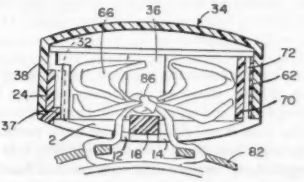


1. A backing member for a pronged fastener component of a garment fastening device, said backing member comprising a substantially rectangular elongated plate body portion having bounding peripheral edges, opposite first and second faces, first and second end regions, a central region intermediate said end regions, a pair of separate elongated recesses re-entrant with respect to said second face of the body portion and longitudinally in alignment with one another, and generally planar portions fully surrounding said recesses and spacing said recesses inwards from the peripheral edges of said body portion, said recesses each being in the form of a discrete localised indentation of substantially arcuate cross section in the body portion extending from a respective said end region towards said centre region, said backing member further comprising, in folded-over relationship with said body portion, an integral tongue portion which confronts said second face in substantially abutting relationship and overlies said recesses to provide, in co-operation therewith, discrete longitudinally spaced-apart pockets each adapted to accommodate and closely confine a clenched-over single said attachment prong of the pronged fastener component, said tongue portion having a pair of apertures disposed one adjacent the outer end of each recess which is remote from the central region of the body portion for entry of the prongs into the pockets, the indentations forming said recesses providing, at said outer ends of the recesses, cam surface elements which engage and deflect the fastener component prongs into said pockets when the prongs are driven through said apertures during the operation of securing the fastener component by means of a clenching press and further providing, contiguous with the cam surface element of each recess, lateral first and second guide surface portions forming opposite sides of the recess which confine laterally the respective prong clenched into said recess, and a third guide surface portion, forming the base of the recess integrally connecting said lateral first and second guide surface portions, which defines the depth of said recess relative to said planar portions and guides the prong during clenching into substantially flat surface contact with the tongue portion overlying said recess whereby to securely clamp the backing member to the garment fabric material, said depth conforming substantially to the thickness of the plate body portion, and wherein the body portion and said tongue portion in substantially abutting relationship therewith has, in transverse cross-section, a shallow curvature convex in relation to said first face of said body portion.

3,908,238
SHOELACE KEEPER

Richard L. Panicci, Hanover, Mass., assignor to Kiddie Products, Inc., Avon, Mass.

Continuation-in-part of Ser. No. 437,222, Jan. 28, 1974, abandoned. This application Jan. 24, 1975, Ser. No. 543,973
Int. Cl.[2] F16G *11/00*
U.S. Cl. 24—119 **12 Claims**



1. A shoelace keeper for an infant's shoelace comprising an enclosure having a wall adjacent a shoe, said wall including

a first wall portion having an edge including at least one shoelace passage having a periphery open at said edge,

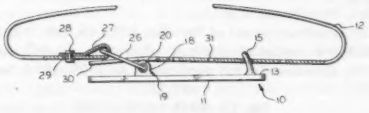
a second wall portion having an edge and movable wtih respect to said first portion to bring said second wall portion edge adjacent said shoelace passage to close said shoelace passage periphery, and

latch means for releasably securing said second wall portion to said first wall portion.

3,908,239
CASTING DECORATIVE ARTICLES

Timothy H. Gorman, 330 W Drexel Ave., Oak Creek, Wis. 53154

Filed Oct. 18, 1973, Ser. No. 407,570
Int. Cl.[2] A44B *11/22;* **A44C** *5/18*
U.S. Cl. 24—163 K **6 Claims**



1. A fastening device comprising;

a generally plate-like, integral cast body having front and rear opposing surfaces,

a hollow, wear-resistant tubular means positioned spaced from said body having its axis generally parallel to said rear surface,

a first elongate raised portion integral with said body fixedly cast about said tubular means, said tubular means being of harder material than said raised portion and including

terminal ends extending at least a finite distance beyond said first raised portion, and

a rotatable, elongate attachment means mounted on said body and having first and second end portions receivably engaged by said terminal ends of said tubular means and an intermediate portion disposed exteriorly of said body and tubular means.

3,908,240
FASTENING DEVICE

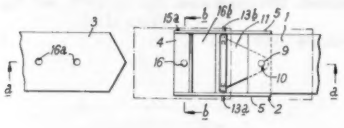
Cyril James Gowland, "White Gates", Hollytree Lane, Cuddington, Aylesbury, HP18 OBA, England

Filed Oct. 29, 1973, Ser. No. 410,754

Claims priority, application United Kingdom, Feb. 8, 1973, 6263/73

Int. Cl.² A44B *11/22*

U.S. Cl. 24—166 **4 Claims**



1. In a device, for fastening together two portions of flexible bands such as belts, straps and bracelets, having a base member, coacting tenon and recess coupling means provided selectively on the base member and on one band portion, a cover member having transversely spaced depending side walls, said cover being secured by said side walls on said base and being slidable with respect to said base into a position in which it overlies the selective coupling means of said base to prevent uncoupling of the band portion, said cover being also slidable into a position in which it does not overlie the selective coupling means of the base, thereby to permit the band portion to be uncoupled, and means for coupling the other band portion to the base, the improvement which comprises resilient locating abutment means carried by at least one side wall of one of said members and biased away therefrom toward an adjacent side wall of the other of said members, locating recess means in a side wall of the other of said members cooperating with said resilient locating abutment means, said abutment means being movable with respect to said side walls, said locating abutment means extending between said side walls, said locating abutment means and said locating recess means being disposed such that by relative sliding of said cover member with respect to said base member said locating abutment means may be caused to enter said locating recess means and thereby releasably retain said cover member in at least one position of sliding movement relative to said base member.

3,908,241
THREADLESS SIDE FASTENER CHAIN

George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 225,146, Feb. 10, 1972, which is a continuation-in-part of Ser. No. 64,487, Aug. 17, 1970, abandoned. This application Aug. 21, 1974, Ser. No. 499,232

Int. Cl. A44b *19/42*, *19/10*

U.S. Cl. 24—205.16 C **19 Claims**

1. In a threadless slide fastener chain, the combination comprising

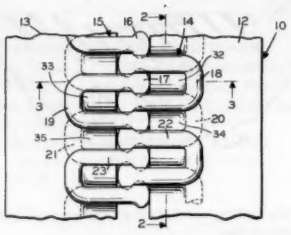
a carrier tape,

a stringer formed from a filamentary material and having a plurality of head elements and a plurality of heel members interconnecting the plurality of head elements,

said stringer being disposed along a longitudinal edge of the carrier tape with the plurality of heel members overlying a side surface of the carrier tape,

said heel members having leg portions forming interstices therebetween,

said carrier tape adjacent the longitudinal edge having portions projecting into the interstices of the stringer by



at least one-half of the thickness of the portions of the filamentary material forming the heel portions, and

each of said heel members being threadlessly bonded with the carrier tape whereby the stringer is firmly attached to the carrier tape.

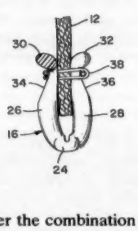
3,908,242
CONTINUOUS FILAMENT SLIDE FASTENER

Rolfe E. Reynolds, Meadville, Pa., assignor to Textron, Inc., Providence, R.I.

Filed May 10, 1973, Ser. No. 359,051

Int. Cl.² A44B *19/10*, *19/40*

U.S. Cl. 24—205.13 C **2 Claims**



1. In a slide fastener the combination comprising

a tape having an inner edge and inner portions adjacent the inner edge;

a continuous filament having a length and forming a plurality of longitudinally spaced head elements along its length, each head element having opposite sides, first and second legs extending from the opposite sides of each head element and being spaced relative to each other, a first plurality of heels joining said first legs which extend from adjacent head elements, a second plurality of heels joining said second legs which extend from adjacent head elements, the inner edge of said tape being interposed between said first and second legs of the head elements along the length of said filament, a first notch formed at a junction between each first leg and its associated first heel and on the exposed side of each first leg, a second notch formed at a junction between each second leg and its associated second heel and on the exposed side of each second leg;

the first and second notches including opposed sloping surface means on the first and second legs of a head element, the opposed sloping surface means on each first or second leg of a head element being angularly oriented in a direction toward said tape; and

thread means extending between and interconnected to inner portions of said tape and the first and second notches such that said thread means is seated in the first and second notches and said filament is secured to said tape;

said first and second pluralities of heels each having a flattened cross sectional configuration positioned against respective opposite sides of the tape with the longitudinal axis of the flattened configuration extending at an oblique angle away from the tape and the head elements.

3,908,243

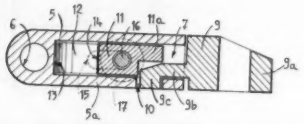
CLASP FOR BOND

Wo Joaa Lou, Bienne; Paul Völgyi, La Neuveville, and Roger Defossez, Preles, all of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Nov. 9, 1973, Ser. No. 414,319

Int. Cl.[2] A44B *11/25*

U.S. Cl. 24—230 AK **2 Claims**



1. A clasp comprising, a first element having a male portion, a second element having a female cavity, the two elements being joined to each other by engagement of the male portion in the cavity, the cavity opening on a front face of said second element, an inwardly disposed wall in said cavity and a recess provided on said wall, the male portion having a protrusion of configuration corresponding generally to that of said recess, said protrusion being disposed in said recess, the height of the male portion being lower than the height of the cavity, a slidable locking member positioned in the cavity, the locking member having a cross-sectional configuration coresponding generally to that of said cavity, the locking member being guided by the cavity walls and engageable into a working position between the male portion and a wall of the cavity positioned opposite the wall having said recess, a blade spring interposed between the bottom of the cavity and a rear face of the locking member to resiliently urge the locking member into its working position, the cavity including opposed lateral walls, each said lateral wall having a respective elongated aperture provided thereon, an operating stem passing through the locking member and extending outside the cavity on either side thereof through the apertures, said locking member being operable from outside the cavity to a release position by movement of the operating stem to move the locking member against the action of the return spring, whereby the locking member in its working position locks the protrusion in the recess to effect locking of the two elements assembled together.

3,908,244

RELEASABLE FASTENING BETWEEN WIPER BLADE AND WIPER ARM IN A WINDSHIELD WIPER

Eckhard Ursel, Buhl, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhoehe, Germany

Filed Feb. 8, 1974, Ser. No. 440,780

Claims priority, application Germany, Mar. 7, 1973, 2311143

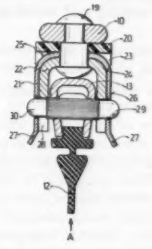
Int. Cl.[2] B60S *1/32*

U.S. Cl. 24—243 R **20 Claims**

1. A releasable fastening between two members, one of which is the wiper arm and the other the wiper blade of a windshield wiper, comprising:

a U-shaped spring clip affixed to a first one of said members, in the jaws of which the second of said members is insertable and, after insertion, capable of being pivotally mounted by the nesting of cylindrical projections into holes, said spring clip carrying either the holes or the projections and the member insertable therein carrying the projections, in the first case, and the holes, in the second case, and

a guiding piece (**22**), also of U-shaped cross-section, likewise affixed to said first one of said members and into which the second of said members is likewise insertable, said guiding piece being capable of transmitting force



between said members independently of said clip and having side walls (**24**) having cut-outs (**28**) of such size as to accept the aforesaid projections (**30,50**), said spring clip (**21**) being closely fitted over said guiding piece (**22**), said insertable second member being held by the aforesaid nesting, whereby it is nondestructively removable from the first member.

3,908,245

CARPET SHEARING MACHINE

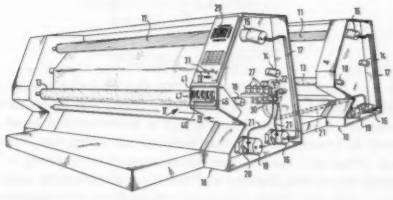
Fritz Büthe, Viersen, Germany, assignor to Firma Johannes Menschner Textilmaschinenfabrik, Dulken, Germany

Filed July 19, 1971, Ser. No. 163,659

Claims priority, application Germany, July 17, 1970, 2035514

Int. Cl. D06c *13/00*

U.S. Cl. 26—15 R **3 Claims**



1. A carpet-shearing machine with members comprising cross-brushes, shearing cylinders and cloth-beams disposed in a machine frame, comprising

pressure fluid means for driving said members,

a servo-control means for maintenance of an always constant relation between cloth speed and number of revolutions of said shearing cylinders,

said servo-control means including setting spindles having setting members thereon, respectively,

a control plate means formed as a program card for causing resetting of said setting members,

said control plate means being equipped with a plurality of exchangeable program-switching ledges, corresponding in numbers with that of setting positions of said setting members, said program-switching ledges capable of being reprogrammed by shortening,

pulse-emitting controlling nominal value potentiometers each having means for adjusting same,

setting motor means for each of said setting members and, an actual value potentiometer disposed on each of said setting spindles of said setting members and operatively

connected with a corresponding one of said nominal value potentiometers,

a plurality of said program ledges, one for each of said nominal value potentiometers,

said program-switching ledges being formed as teeth means projecting on one side for an operative mechanical joinder with said adjusting means of said nominal value potentiometers for setting said nominal-value-potentiometers,

each of said nominal value potentiometers having associated therewith an electronic control means for operatively controlling and comparing said corresponding actual value potentiometer therewith, and for driving a corresponding one of said setting motor means only until said actual value potentiometer is in position coincidence with said nominal value potentiometer and for terminating the preselection program by stopping said corresponding setting motor means upon position coincidence of said actual value potentiometer with said nominal value potentiometer, thereby fixing the setting position of said setting members on said setting spindles, respectively.

3,908,246

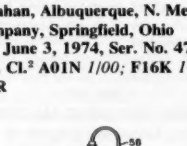
EMBALMING APPARATUS

William F. Hannahan, Albuquerque, N. Mex., assignor to The Champion Company, Springfield, Ohio

Filed June 3, 1974, Ser. No. 475,649

Int. Cl.[2] A01N *1/00;* **F16K** *19/00*

U.S. Cl. 27—24 R **13 Claims**



1. In a back-siphoning prevention device including an aspirating means for withdrawing body fluids for embalming, a connector ring adapted to engage a faucet and a bowl supported in spaced relationship beneath said ring for receiving water from said faucet, the improvement comprising a fluid control means for feeding and mixing a disinfectant with said water while providing automatic shut-off of said disinfectant when said aspirating means is shut-off and preventing back-flow of fluids to said disinfectant, said fluid control means comprising a chamber having a lower end located adjacent and integrally sealed to the bottom of said bowl and an upper end sealed by a removable sealing means and including a water inlet, a disinfecting fluid inlet and an outlet for said fluid mixture, said water inlet having a lesser fluid capacity than said outlet and said disinfecting fluid inlet including means for preventing back-flow into said disinfecting fluid inlet.

3,908,247

APPARATUS FOR CONVEYING ELONGATED MATERIAL SUCH AS TEXTILE MATERIAL

Lonnie A. Murphy, Chattanooga, Tenn., assignor to Wadsworth-Greenwood Corporation, Dalton, Ga.

Filed Oct. 25, 1973, Ser. No. 409,465

Int. Cl.[2] D06P *3/00*

U.S. Cl. 28—1 R **24 Claims**

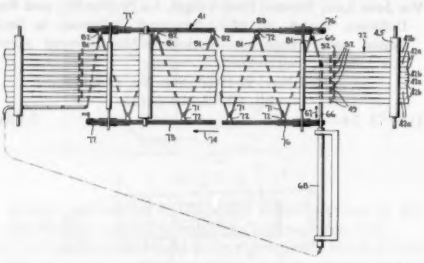
1. An apparatus for conveying a plurality of webs along a planar path through a work station, comprising:

guide means for dividing the webs into at least two arrays;

displacement means for separating the guide means to displace the two arrays laterally out of the plane of the path;

shuttle means for carrying a strand of material between the two arrays and across the path when the arrays are displaced;

intercepting means for capturing the strand of material on each side of the path;



transport means for moving the intercepting means parallel to the path so that the captured strand moves parallel to the path; and

activating means for reversing the displacement of the arrays to move the webs in opposite directions through the planer path after the intercepting means has captured the strand of material to thereby entrain the webs with the strand and cause the transport means to convey the webs along the path.

3,908,248

APPARATUS FOR TEXTURIZING FILAMENTS

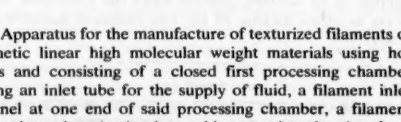
Hans Schmid, Limburgerhof, and Heinrich Feldhoff, Bad Duerkheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 17, 1974, Ser. No. 480,149

Claims priority, application Germany, June 19, 1973, 2331045.

Int. Cl.[2] D02G *1//16*

U.S. Cl. 28—1.4 **4 Claims**



1. Apparatus for the manufacture of texturized filaments of synthetic linear high molecular weight materials using hot fluids and consisting of a closed first processing chamber having an inlet tube for the supply of fluid, a filament inlet channel at one end of said processing chamber, a filament guide channel projecting into said processing chamber from its other end, said filament guide channel being rigidly mounted on the said processing chamber and the ratio of the internal diameter of the filament guide channel to that of the filament inlet channel being from 1:1 to 1:4 and the distance between the filament guide channel and the filament inlet channel being from 0.1 to 3 mm, and a second, duct-like processing chamber located at the free end of the filament guide channel and provided with radial slots extending in the longitudinal direction of the duct, wherein the second, cylindrical processing chamber having radial slots extending in the longitudinal direction of the duct shows, over its lower portion, stepwise increase in its external diameter and a sudden increase in its internal diameter to from 2 to 10 times the internal diameter of the duct, the longitudinal slots extending into said enlarged region to be terminated by a closed ring located at the end of said enlarged region.

3,908,249

WARP-TYING FRAMES COMBINED WITH A CARRIAGE

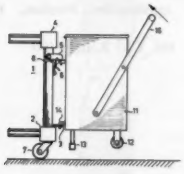
Alois Altenweger, Uster, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed June 28, 1974, Ser. No. 484,338

Claims priority, application Switzerland, June 28, 1973, 9423/73

Int. Cl.[2] D03J 1/16

U.S. Cl. 28—49 8 Claims



1. A warp-tying arrangement comprising:

a warp-tying frame means including at least one base bar and at least one vertical support member;

a carriage means;

means for movably supporting said carriage means on a support surface; and

means for selectively mounting said carriage means on said frame means with said means for movably supporting said carriage means withdrawn from the support surface.

3,908,250

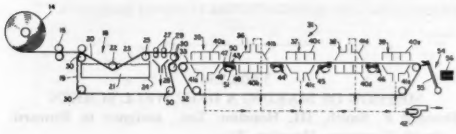
GARMENT PRODUCTION PROCESS

Ernest W. Agan, Jr., Maiden; Grady P. Childers, Kings Mountain, both of N.C.; Walter Wade Frost, Vidalia, and John P. Hunter, Jr., Dunwoody, both of Ga., assignors to Oxford Industries, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 265,544, June 23, 1972, abandoned, which is a continuation-in-part of Ser. No. 252,318, May 10, 1972, abandoned. This application July 30, 1973, Ser. No. 384,093

Int. Cl. D06h 7/02, 7/22; D06c 29/00

U.S. Cl. 28—76 T 8 Claims



1. A process of manufacturing garment parts or the like comprising knitting a length of material comprising a series of garment parts with yarns knitted into the length of material between the garment parts which are water soluble at temperatures above 125°F., placing the length of material in a dry condition on a belt conveyor system, moving the length of material along its length with the belt conveyor system through a path, bathing the length of the material as it moves along its path at its water soluble yarns with an aqueous solution at a temperature above 125°F. to dissolve the water soluble yarns and separate the garment parts of the material, squeezing the garment parts as they move along their path to remove the aqueous solution from the garment parts, alternately heating the garment parts as they move along their path from opposite sides of the path to dry the garment parts, and vibrating the garment parts as they move along their path at spaced intervals along the path.

3,908,251

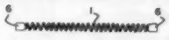
METHOD OF MAKING BEADED FILAMENT COIL

Joseph A. Roy, Danvers, and Gary C. Bradway, Essex, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 11, 1974, Ser. No. 460,000

Int. Cl.[2] H01J 9/00

U.S. Cl. 29—25.17 2 Claims



1. The method of making nonentangling filaments for fluorescent lamps comprising the steps of: primary coiling tungsten wire on a mandrel comprising tungsten wire in parallel with a wire of a dissimilar metal; secondary coiling the wire and mandrel on a second mandrel; cutting the secondary coiling to predetermined lengths; and forming a glass embedment at each end of the predetermined lengths.

3,908,252

DISCHARGE TUBE PROVIDED WITH AN ELECTRODE COMPRISING NICKEL AND ALUMINUM

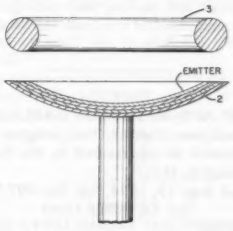
Henricus Gerardus Antonius Willems, Terneuzen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,676

Claims priority, application Netherlands, Sept. 12, 1972, 7212336

Int. Cl.[2] H01J 9/00

U.S. Cl. 29—25.17 6 Claims



1. A method of manufacturing a gas or vapour discharge tube in which the discharge tube is provided with an internal electrode which comprises providing an electrode which comprises a sandwich of layered metals, successive layers being nickel, iron and aluminum, said aluminum layer being less than 15 microns and maintaining said sandwich in a non-oxidizing atmosphere at a temperature of at least 700°C for a maximum of 15 minutes.

3,908,253

CARTRIDGE CASE TRIMMING MACHINE

Robert J. Bolen, Port Penn, Del., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

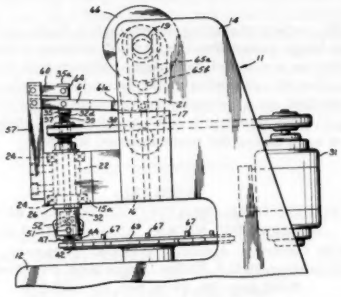
Division of Ser. No. 348,488, April 6, 1973, Pat. No. 3,863,529. This application July 23, 1974, Ser. No. 490,947

Int. Cl.[2] B23P 15/22; B23B 5/16

U.S. Cl. 29—1.32 8 Claims

1. A trimming machine for a tubular casing having a longitudinal axis and an open end, said trimming machine comprising:

a mandrel;
cutting means;
means mounting said mandrel for reciprocation along the longitudinal axis of the tubular casing for movement between axial positions extended into the open end of the casing and withdrawn therefrom;
means mounting said cutting means for rotation about said longitudinal axis, for reciprocation along said longitudinal axis between axial positions extended for engaging said tubular casing and withdrawn therefrom, and for movement with a radial component of direction with respect to said longitudinal axis;



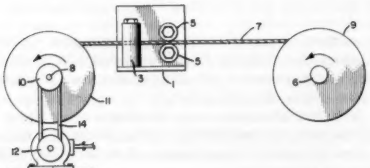
and means drivingly connected with said mandrel and said cutting means and constructed and arranged for moving said mandrel and cutting means to their said extended axial positions while moving said cutting means radially into the casing to cut a scrap ringlet therefrom and hold the ringlet on said mandrel, and for subsequently moving said mandrel and cutting means to their said withdrawn axial positions and moving said cutting means radially away from said mandrel to release the scrap ringlet previously cut.

3,908,254

METHOD AND APPARATUS FOR CABLE SENSITIZING

Herbert H. Thompson, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 15, 1974, Ser. No. 497,790
Int. Cl.² B01J *17/00*
U.S. Cl. 29—25.35 **3 Claims**



1. A method of changing the sensitivity of response of a polarized cable sensor means of the dielectric filled coaxial cable variety to external mechanical stress comprising the steps of:

a. subjecting said polarized cable sensor means of the dielectric filled coaxial cable variety to a slight compressive transverse force along the length thereof in a first selected plane and then

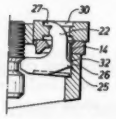
b. subjecting said polarized cable sensor means to a slight compressive transverse force along the length thereof in a second selected plane substantially orthogonal to said first selected plane whereby the sensitivity of response of said sensor cable is increased.

3,908,255

PIN-TYPE CLAMPING DEVICE FOR CUTTING INSERTS IN TOOL HOLDERS

Kurt Heinrich Albert Erich Faber, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Continuation of Ser. No. 418,218, Nov. 23, 1973, abandoned. This application Jan. 3, 1975, Ser. No. 538,373
Claims priority, application Sweden, Dec. 13, 1972, 16243/72
Int. Cl.² B26D *1/00*
U.S. Cl. 29—96 **6 Claims**



1. In a clamping device for a pin-type tool holder including an angular lever arm shank of which forms a clamping pin, the other shank extending sideways from said one shank and being actuated by a clamping screw, the improved construction wherein the remote end of the clamping pin has a lateral clamping projection (27) actuating on a cutting insert from above, and wherein the lever arm has a fulcrum formed by a contact point (25) on said lever arm which fulcrum is located at the junction of said shanks, and abuts and is downwardly slideable, during the clamping action by axial movement of said clamping screw, along a sliding surface (26) extending substantially in the same direction as said clamping pin, whereby pressure from said clamping screw is directly transferred in the said direction to said clamping projection.

3,908,256

METHOD OF MAKING A DEEP WELL SCREEN

Howard F. Smith, III, Houston, Tex., assignor to Howard Smith Company, Houston, Tex.

Division of Ser. No. 302,425, Oct. 31, 1972. This application Sept. 24, 1973, Ser. No. 399,839
Int. Cl.² B23P *15/16*
U.S. Cl. 29—163.5 CW **5 Claims**

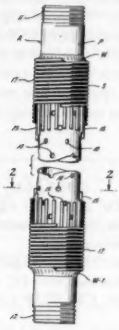
1. A method of making a well screen sleeve which is adapted for use in deep wells with a pipe having a perforated section, comprising:

forming a wire screen sleeve unit by wrapping screen wire on a plurality of circumferentially spaced longitudinal rib wires and welding said screen wire to said rib wires in a relationship to provide predetermined fluid passages through the wrapped screen wire;

thereafter, positioning said formed wire screen sleeve unit over a pipe having a perforated section so as to surround said perforated section with said wire screen sleeve unit; and

making an annular welded connection between each end of said wire screen sleeve unit and said pipe to block flow of

well fluids by the ends of the wire screen sleeve unit and force flow from externally of said wire screen sleeve unit



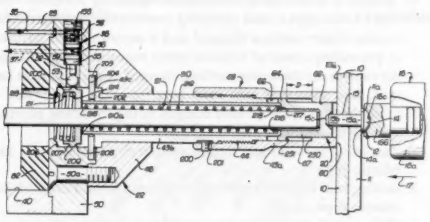
to pass through the predetermined fluid passages formed by the wrapped screen wire.

3,908,257

GO, NO-GO RIVET GUN

Franklin S. Briles, 3600 Catamaran, Corona Del Mar, Calif. 92625

Filed Aug. 14, 1974, Ser. No. 497,309
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—243.54 **12 Claims**



1. In a gun for upsetting the shank terminal of a metallic rivet projecting from work, the combination comprising

a. a forwardly extending tubular barrel,

b. a plunger tube driven forwardly within the barrel for transmitting upsetting force,

c. an anvil carried by and movable axially relative to the barrel between the plunger and rivet terminal to receive said upsetting force and to deliver same to the rivet terminal,

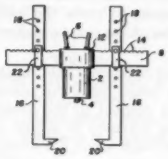
d. and means responsive to displacement of the anvil relative to the barrel as the barrel is advanced toward the work with the anvil in engagement with the rivet terminal for enabling said forward driving of the plunger when the anvil is within a predetermined axial range of positions relative to the barrel, and for disabling said forward driving of the plunger when the anvil is outside said range of positions.

3,908,258

HYDRAULIC PULLER

Thomas Barty, 2756 W. 37th Ave., Vancouver, British Columbia, Canada (V6N 2T6)

Filed Dec. 6, 1974, Ser. No. 530,130
Int. Cl.[2] B25B *27/02;* **B23P** *19/02*
U.S. Cl. 29—252 **13 Claims**



1. A hydraulic puller comprising:

a double acting hydraulic cylinder having a ram projecting from its front end, a piston connected to the ram and reciprocable within the cylinder and means to permit the application of hydraulic pressure to the piston;

a strong back of spaced limbs extending laterally from each side of the cylinder and fixed relative to the cylinder;

notches formed in the rear edge of each limb of the strong back, each notch being aligned with a notch on the other limb;

a puller arm positioned between the spaced limbs of the strong back on both sides of the hydraulic cylinder;

a plurality of holes through each puller arm arranged longitudinally, each hole alignable with the notches in the strong back;

pulling jaws at the end of the puller arms positioned to cooperate with the ram when the puller is in use;

two clips, each dimensioned to lie across the upper limb of the strong back;

a lug formed on each clip to abut the front edge of the strong back;

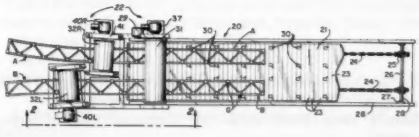
engagement means projecting from each clip and positioned so that when the lug on the clip abuts said fromt edge, the engagement means can pass through a hole in each puller arm to engage a pair of aligned notches in the strong back.

3,908,259

CAMBERING ATTACHMENT FOR TRUSS ASSEMBLY JIG USING CANTED ROLLER PRESS

James D. Adams, P.O. Box 7462, Colorado Springs, Colo. 80933

Filed Jan. 31, 1975, Ser. No. 546,021
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—432 **7 Claims**



1. In a truss assembly jig for forming a timber truss having parallel upper and lower chords and diagonal struts between the chords, with the truss members, the chords and the struts being fastened together by spiked gusset plates, the combination including:

a. a movable support surface whereon the truss members are placed in preassembled, longitudinal position to be

thereafter moved to and from a discharge end of the support surface;

b. a pair of first roll means near the discharge end of the support surface including a roll spaced above the surface a distance sufficient to partially impale the gusset plates into the wood truss members as the truss moves thereunder towards the discharge end of the surface;

c. a pair of finishing roll means a short distance beyond the discharge end of the surface to receive a truss as it moves from the support surface, said finishing roll means having rolls spaced apart to press the gusset plates into and against the sides of the truss members to finish the truss; and

the improvement wherein: the finishing roll means is skewed at an angle from the normal transverse axial alignment with respect to the longitudinal axis of the support surface whereby to impart a camber to a truss passing therethrough which is initially placed in longitudinal alignment upon the support surface.

7. In the method of manufacturing a wooden joist truss, including longitudinal upper and lower wooden chords with wooden cross-bracing members, with a predetermined camber, which includes assembling wooden components, an assembly in the form of a joist truss with the upper and lower chord members in straight and parallel arrangement, placing toothed, metal gusset plates on each side of each joist, moving such assembly through a first roller press set at a normal angle to the longitudinal axis of the truss to partially embed the teeth of the gusset plates in the wooden members, and the improvement of passing the partially finished truss through a second roller press having the axis of its rolls set at a small angle to a normal position to the longitudinal axis of the truss passing through the first roller press to form a camber of predetermined dimensions in the truss.

3,908,260

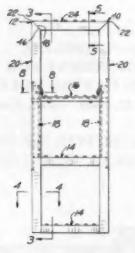
METHOD OF MAKING A TRUCK LADDER

Charles M. Loomis, R. No. 3, Box 92, Arkansas City, Kans. 66104, and Gerald M. Loomis, 1017 N. 9th, Arkansas City, Kans. 67005

Division of Ser. No. 405,826, Oct. 12, 1973. This application Oct. 29, 1974, Ser. No. 518,468

Int. Cl.² B23P *11/00*

U.S. Cl. 29—434 **9 Claims**



1. A method of making a multiple-step ladder adapted to be attached to a truck body, said method comprising

forming from sheet metal an elongated parallel-edged blank,

forming two pairs of transversely-aligned vee-bottomed notches in the opposite edge portions of said blank,

said pairs of notches being formed equidistant from the opposite ends of said blank at locations corresponding to the intended locations of the ends of the top step of the ladder,

bending the thus-notched opposite edge portions of said blank perpendicular to the remainder thereof along parallel longitudinal bending lines through the centers of said notches to form a channel member having a central wall and parallel side walls,

bending said channel member along transverse bending lines through each pair of said transversely-aligned notches into a central top step member and a pair of parallel ladder side members perpendicular to said top step member and integral therewith,

preparing a plurality of lower step members with lengths corresponding substantially to the distance between said central walls of said opposite side members,

and securing the opposite end portions of said lower step members to said opposite side members within the channels thereof and in spaced parallel relationship to said top member.

3,908,261

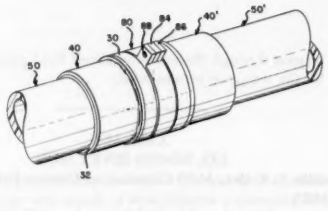
METHOD OF JOINING PLASTIC PIPE

Henry William Demler, Sr., Lebanon, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 351,742, April 16, 1973, Pat. No. 3,877,735. This application Nov. 11, 1974, Ser. No. 522,652

Int. Cl.² B23P *11/02*

U.S. Cl. 29—450 **1 Claim**



1. A method of joining two plastic pipes arranged end to end, said method comprising the steps of:

a. sliding a rigid ring onto each of said two plastic pipes;

b. sliding a deformable cylindrical coupling member onto one of said pipes, said coupling member having serrations on the outer surface thereof and a smooth inner surface;

c. providing a pair of tubular insert members, each having serrations on the outer surface thereof and a flange at one end, and inserting said members into the open ends of said plastic pipe with said flanges being in facing position one to the other;

d. fastening said flanges together thereby joining said two plastic pipe;

e. sliding said coupling member over said joined ends of said plastic pipe; and

f. sliding each rigid ring onto an end of said coupling member whereby said serrations thereon are compressed and the structure thereof transferred to the inner walls of said plastic pipe in registration with said serrations on said insert members thereby locking said pipe onto said insert members.

3,908,262

PROCESS FOR THE PRODUCTION OF A TWO-PHASE CHARGE SHIFT ARRANGEMENT FOR CHARGE COUPLED DEVICES

Karl-Ulrich Stein, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 31, 1974, Ser. No. 493,267

Claims priority, application Germany, Aug. 14, 1973, 2341154

Int. Cl.² B01J *17/00*

U.S. Cl. 29—579 **5 Claims**

1. A process for the production of a two-phase charge shift arrangement for a charge coupled device which includes:

forming an electrically insulating layer on a semiconductor substrate,
forming a metal layer on said insulating layer,
covering said metal layer with a photo-resist layer,
selectively etching said photo-resist layer and said metal layer to form a row of gaps which extend completely through said photo-resist layer and said metal layer to provide a row of electrodes, the etching step including under-etching said photo-resist layer in each of said gaps to provide a wider gap in said metal layer than in said

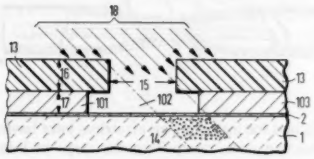


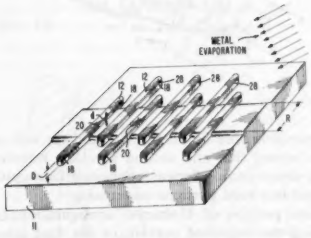
photo-resist layer, the ratio of the width of said gap in said photo-resist layer to the total height of said gap through both said photo-resist layer and said metal layer being approximately 1:1,
and then irradiating said gaps with an ion beam directed at an angle to the surface of said substrate to cause ions to be implanted in said substrate below one edge region of each of said electrodes and in said substrate below a portion of the bottom of said gaps adjacent said one side of each said electrode.

3,908,263

SEPARATE INTERDIGITAL ELECTRODES WITHOUT USING ANY SPECIAL PHOTOLITHOGRAPHIC TECHNIQUES

Ralph Jerome Matarese, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,757
Int. Cl.² H05K 3/16
U.S. Cl. 29—592 **10 Claims**



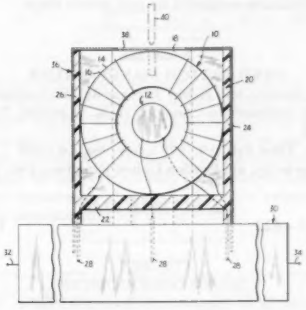
1. In a method of forming interdigitated electrodes comprising the steps of:
a. forming a plurality of substantially parallel, spaced, raised strips on a surface of a substrate with said strips disposed such that at one end of said strips the end portions of one set of alternate strips project beyond the end portions of the remaining set of alternate strips while at the other end of said strips the end portions of said remaining set of alternate strips project beyond the end portions of said one set of alternate strips, each one of said strips having a surface spaced from said surface of the substrate with a portion of the strip surface being spaced a greater distance from said substrate surface than the remaining portion of the strip surface,
b. creating a flow of metal vapors from a source which is spaced from said substrate surface with the flow of vapors extending along planes which are at an angle less than 90° with respect to said substrate surface, and
c. depositing said metal vapors on said strip surfaces and substrate surface so as to form through shadow effect deposition a plurality of metal film electrodes on said strip surfaces with the electrodes on the one set of alternate strips being connected by a metal film on the substrate surface at the one end of the strips and the electrodes on the remaining set of alternate strips being connected by a metal film on the substrate surface at the other end of the strips.

3,908,264

METHOD FOR CALIBRATING A RESONANT FREQUENCY

Vincent P. Friberg, Longmeadow, Mass., and John Chesney, Roselle Park, N.J., assignors to General Instrument Corporation, Clifton, N.J.

Filed Apr. 24, 1974, Ser. No. 463,579
Int. Cl.² H01F 7/06
U.S. Cl. 29—593 **2 Claims**



1. A method of calibrating a resonant frequency circuit of the type situated, under normal operating conditions, within a shielding enclosure and having an inductor with a portion of the core thereof exposed, the method comprising the steps of placing the circuit within a test enclosure simulating the shielding enclosure to be used with said circuit, energizing the circuit to simulate actual operating conditions, said test enclosure having an opening aligned with the exposed portion of the core, inserting through the opening a tool capable of removing a portion of the core material, removing the appropriate amount of core material such that the frequency of the resonant circuit is adjusted to the desired level, removing the test enclosure and placing the circuit into a shielding enclosure.

3,908,265

METHOD OF MAKING COMMUTATOR STRUCTURE FOR THE ROTOR OF A DYNAMO-ELECTRIC MACHINE

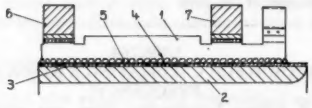
Werner Heil, Birr, Switzerland, and Heinrich Moser, Waldshut, Germany, assignors to Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

Division of Ser. No. 259,572, June 5, 1972, abandoned. This application Feb. 26, 1974, Ser. No. 445,956
Claims priority, application Switzerland, June 15, 1971, 8683/71
Int. Cl.² H01R 43/06
U.S. Cl. 29—597 **6 Claims**

1. The method of producing and mounting a commutator structure for a dynamo-electric machine on a cylindric support part thereof which comprises the steps of:
assembling the commutator segments in a cylindric array,
applying shrink rings to said cylindric array of commutator segments to secure them together and establish a predetermined arch pressure thereon,

bringing said cylindric array of commutator segments into position over said cylindric support part, the inner diameter of said cylindric array of commutator segments being greater than the outer diameter of said support part thereby to establish an annulus therebetween,

filling said annulus with an elastic insulating material comprising glass fibers impregnated with a thermo-set synthetic resin, and



cementing said elastic insulating material to the inner periphery of said shrink ring secured commutator segment array and to the periphery of said cylindric support part, the elasticity of said insulating material which fills said annulus serving to prevent any possible reduction in the arch pressure produced by said shrink rings.

3,908,266

REED SWITCH MANUFACTURE

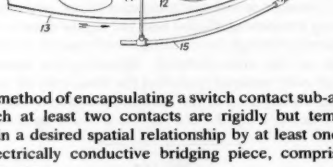
John Hill, Bickley, and Henry Turczanski, Beckenham, both of England, assignors to Comtelco (U.K.) Limited, Tonbridge, England

Filed Feb. 19, 1974, Ser. No. 443,203

Claims priority, application United Kingdom, Feb. 20, 1973, 8276/73

Int. Cl.² H01H *11/00*

U.S. Cl. 29—622 **10 Claims**



1. A method of encapsulating a switch contact sub-assembly in which at least two contacts are rigidly but temporarily joined in a desired spatial relationship by at least one fusible and electrically conductive bridging piece, comprising the following steps:

1. inserting the contact sub-assembly into a length of glass tube, the length of the tube being greater than the desired length of the capsule being formed, an end of the contact sub-assembly protruding from a first end of the tube;
2. holding said contact sub-assembly and tube in co-axial relationship for sealing;
3. Providing a flow of purge gas to the interior of said tube;
4. sealing the first end of the tube to the protruding end of the contact sub-assembly by directing a flame toward the first end while maintaining the flow of purge gas into the tube;
5. heating the tube whereby contaminants within the tube are flushed away by the purge gas; and
6. forming a second seal by directing a flame toward a region of said tube situtate between the two ends of the tube at a distance from the first end corresponding to the desired length of said capsule and while maintaining the flow of purge gas into the tube.

3,908,267

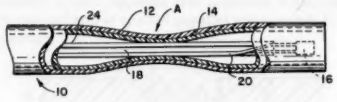
METHOD OF APPLYING AN INSULATING CONNECTOR

Patrick V. Loyd, West Laurel, and Samuel M. Mills, University Park, both of Md., assignors to Stone Industrial Corporation, College Park, Md.

Division of Ser. No. 282,977, Aug. 23, 1972, Pat. No. 3,814,139. This application Mar. 22, 1974, Ser. No. 453,802

Int. Cl.² H01B *19/00*

U.S. Cl. 29—631 **6 Claims**



1. A method for insulating an electrical joint having at least one conductive wire, comprising the steps of inserting the joint into a laminated tubular connector having a relatively rigid, heat-shrinkable dielectric outer layer and an adhesive inner layer, pinching a portion of said connector to seal portions of said inner layer to itself whereby a desired relative positioning of said joint and said connector may be maintained during assembly operations, and subsequently heating said connector to shrink said outer layer and to cause said inner layer to flow about said joint.

3,908,268

WIRE-HOLDING ATTACHMENT FOR WIRE-CLIPPERS

Frank R. Brown, Clinton St., Antrim, N.H. 03440

Filed July 8, 1974, Ser. No. 486,476

Int. Cl.² B26B *17/04*

U.S. Cl. 30—124 **5 Claims**

1. A removable wire-holding device for use with wire-cutting pliers having first and second pivotally interconnected levers, the levers having forward opposing-face cutting edge surfaces and rearward portions comprising:

A. a base portion of U-shaped configuration resiliently gripping the rearward portion of the first lever of the wire-cutting pliers so as to allow removal of the device from the pliers;

B. a curvilinear finger member projecting from the base portion in a substantially adjacent configuration to the first lever; and

C. a blade member projecting from the other end of the finger member

a. of length approximately equal to the cutting length of the cutting edge surface of said first lever,

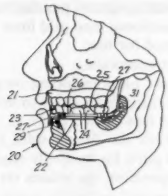
b. with an edge thereof projecting toward the cutting edge surface of the second lever of said pliers forming a space therebetween, when said cutting edge surfaces are closed, less than the wire diameter of the wire to be cut;

whereby said edge resiliently urges each severed wire end toward said second lever until said cutting edge surfaces are separated by the user.

3,908,269
IMPLANT DENTURE FRAMEWORK

Fred A. Christenot, Box 972, Livingston, Mont. 59047, and Wallace W. Cloyd, 906 Wyoming Ave., Billings, Mont. 59102

Filed Dec. 20, 1973, Ser. No. 426,467
Int. Cl.² A61C 13/00
U.S. Cl. 32—10 A 2 Claims

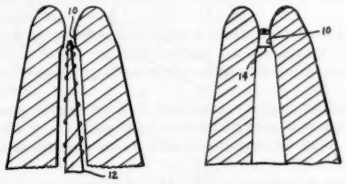


1. A denture frame comprising a pair of posterior endosseous blade type implants inserted directly into the bone of the ascending ramus and body of the mandible, the implants being of malleable material and shaped to conform to the angle of the mandible, slots cut in the outer end of each posterior implant, an anterior endosseous blade implant shaped to conform to the curvature of the mandible, slots cut in each end of the anterior implant, a pair of support bars for supporting a denture, the bars being oppositely curved so that each bar will conform to the shape of one side of the mandible, and spring clip locking means cooperating with the slots on both ends of the anterior implant and on the ends of both posterior implants to lock the support bars in place when the support bars are inserted in the slots and therefore extend from the anterior implant to the posterior implant.

3,908,270
ENDODONTIC APICAL SEALER METHOD AND APPARATUS

Mark J. Fishman, 877 E. 54th St., Brooklyn, N.Y. 11234

Filed June 29, 1973, Ser. No. 374,824
Int. Cl.² A61K 5/02
U.S. Cl. 32—15 9 Claims



3. An apical sealing element for sealing the apex of a tooth root canal which has been instrumented to a predetermined size and shape at said apex comprising

a non-resilient frusto-conical solid of revolution of a size and shape corresponding to the dimensions of the apical end of said root canal to mate therewith,

a domed portion at the smaller end of said frusto-conical solid of revolution,

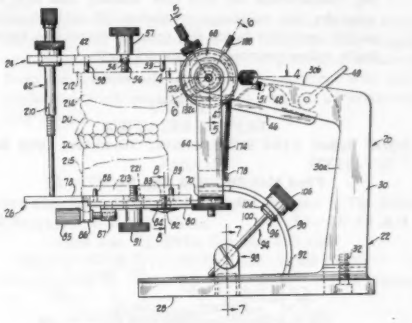
means on the outer periphery of said frusto-conical solid of revolution and projecting therefrom for sealing said solid of revolution to the apical end of a root canal, and

means at the larger end of said solid of revolution for utilization in placement of said element.

3,908,271
DENTAL ARTICULATOR

Harry J. Derda, 81 Powers Rd., Bedford, Ohio 44146, and Charles H. Gibbs, 1918 Southwest 48th Ave., Gainesville, Fla. 32608

Filed June 20, 1973, Ser. No. 371,702
Int. Cl.² A61C 11/00
U.S. Cl. 32—32 52 Claims

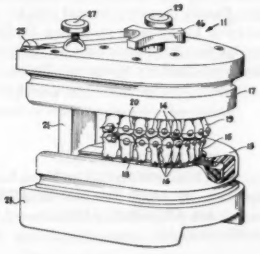


1. A dental articulator comprising a support, two generally opposed jaw-like first and second connections between one said member and the support that permit complex movement of said one member relative to the other, and means, including a rigid link functionally constant in length between said one member and the support pivotally connected to both, to constrain said movement of said one member relative to said support to simulate chewing movement.

3,908,272
ORTHODONTIC MODEL

George R. Arnold, Napa, Calif., assignor to Silverado Industries, Inc., Napa, Calif.

Filed May 9, 1974, Ser. No. 468,254
Int. Cl.² A61C 19/00
U.S. Cl. 32—71 11 Claims



1. An orthodontic model of teeth comprising,

a first planar support member having a shape generally simulating a human jaw, said first planar support member including a first base, a first housing defining a U-shaped raceway simulating the position of a human jaw nested within said first base, and a first raceway cap covering a portion of said first housing; said first base, first housing and first cap being coplanar, with said first housing and first cap being compressibly connected,

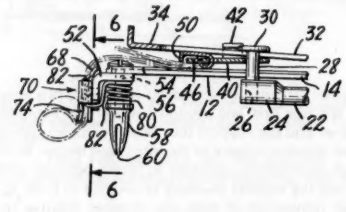
a plurality of socket members, each socket member slidable within said first raceway to a desired position therein, each socket having a rotatable ball therein and having compression means for alternately holding and releasing said ball,

a plurality of spline members, each spline member passing through one of said balls, each spline having a model tooth affixed to the end of said spline, with all of said model teeth disposed on the same side of said plane, and first clamping means associated with said first support member communicating with said compression means, said first clamping means connected to said first housing and first raceway cap for alternately exerting and releasing compression on said first housing and first cacap whereby the compression means of said plurality of socket members holds and releases respective rotatable balls, spline members and model teeth.

3,908,273
DENTAL RETAINER

David Reiter, 5104 Skillman Ave., Woodside, Long Island, N.Y. 11377

Filed May 28, 1974, Ser. No. 473,422
Int. Cl.² A61C *5/12*
U.S. Cl. 32—63 **1 Claim**

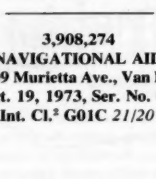


1. In a dental matrix band retainer comprising an elongated base and a head mounted on one end thereof, said head having an elongated opening therein substantially perpendicular to said base for receiving the matrix band, said opening being closed at two opposed ends, said head having a V-shaped extension depending therefrom for engaging the matrix band, said matrix band retainer further comprising a wedge mounted on and depending from said base, a slot in said head facing said base, and means on said base extending through said slot for slidably mounting said head to said base, wherein said means comprises a bracket pivotally mounted on said base, and an extension fixedly mounted to said bracket and extending through said slot for slidably mounting said head to said bracket, said wedge fixedly mounted on said pivotable bracket and spaced from said head for wedging adjacent teeth apart, whereby said wedge is pivotable with respect to said base.

3,908,274
NAVIGATIONAL AID

Julian E. Gerry, 5809 Murietta Ave., Van Nuys, Calif. 91401

Filed Oct. 19, 1973, Ser. No. 407,877
Int. Cl.² G01C *21/20*
U.S. Cl. 33—1 SD **2 Claims**



1. In a portable navigational aid for providing a course and bearing computation in conjunction with a sectional chart having a vertical north/south parallel grid lines, said aid comprising:

a pair of independently rotatable parts mounted to each other in a facing relationship and at a common center for rotation thereabout;

the first of said parts being completely circular including bearing indicia about its circumference, with a zero-index marker extending radially from such circumference;

the second of said parts being transparent and having a greater peripherial dimension than that of the first of said parts, and including spaced parallel lines for proper alignment to said sectional map grid lines onto which said aid is to be mounted for use;

the improvement comprising,

said second of said parts including means defining at least one slotted opening contiguous to and along the circumference of said first of said parts;

means mounted on the facing sides of said marker and second of said parts for mutually engaging said parts in a fixed angular position, the means on said second of said parts being disposed arcuately across one of said spaced parallel lines;

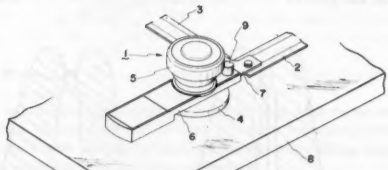
said slotted opening comprises a plurality of arcuate slotted openings arranged in a 360° circle about the periphery of said first part and said second part having a bridge portion joining opposing ends of said plurality of slotted openings; an additional slotted opening adjacent to and spaced from each of said bridge portions carried by said second part; said first part is a disc and said second part is substantially square with a pointed portion projecting outwardly from one side thereof; and

additional indicia carried along the side of said second part opposite to said side carrying said pointed portion wherein said additional indicia is related to distance measurements.

3,908,275
DRAWING APPARATUS

Osamu Shimizu, Tokyo, Japan, assignor to Mutoh Industry Ltd., Tokyo, Japan

Filed Jan. 17, 1974, Ser. No. 434,112
Claims priority, application Japan, Jan. 31, 1973, 48-12039
Int. Cl.² B43L *13/00*
U.S. Cl. 33—75 R **18 Claims**



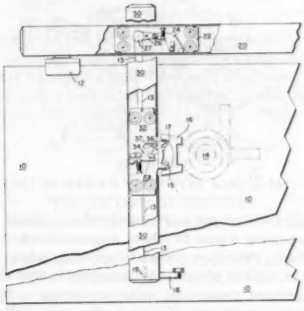
9. A drawing apparatus comprising a head adapted to be placed on the surface of a drawing board without requiring any outside supporter, said head comprised of a base of a shape adapted for positioning the head on the surface of the drawing board, a rotary member rotatably connected to said base, angle deviation detection means for detecting an angular deviation directional line defined by said rotary member from a predetermined imaginary reference line and producing an angular deviation signal responsive thereto, drive means built in said head for angularly rotating said rotary member, and control means built in said head and coupled to said drive means and said angle deviation detection means, and adapted automatically to control the direction and amount of angular rotation of said rotary member based on the angular deviation

signal produced by said angle deviation detection means so as to render said angular deviation signal zero, and at least one ruler connected to said rotary member.

3,908,276
DRAFTING MACHINE BRAKING SYSTEM

J. Peter E. Kooi, Succasunna, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Feb. 25, 1974, Ser. No. 445,709
Int. Cl.² B43L *13/02*
U.S. Cl. 33—76 R **2 Claims**



1. In a drafting machine comprising a horizontally disposed track member, a horizontal motion carriage arranged to travel along the horizontal track, a vertically disposed track member carried by said horizontal carriage for movement therewith, a vertical motion carriage arranged to travel along the vertical track, a drafting head carried by said vertical carriage for movement therewith and with said vertical member, said drafting head thereby having two orthogonal degrees of freedom of movement over the surface of a drafting board, braking means for individually arresting the travel of each of said carriages to thereby limit the respective degrees of freedom of said drafting head, and means within reach of the hand of a draftsman grasping said drafting head for actuating vertical motion carriage braking means, the improvement in said braking means whereby actuation thereof to control the travel of both said carriages may at all times be effected by the hand of a draftsman stationed at said drafting head, said improvement comprising:

a. a braking member including a brake shoe mounted on said horizontal motion carriage for movement to and from carriage-arresting contact with said horizontal track member;

b. means carried by said horizontal motion carriage arranged to normally urge said brake shoe into said carriage-arresting contact with said horizontal track member;

c. lever means coupled to said braking member arranged to transfer to said braking member actuating force applied to a distal arm thereof to thereby overcome said urging means and effect separation of said carriage-arresting contact between said brake shoe and horizontal track member;

d. a pair of pulleys, the first being mounted on said lever means distal arm for movement therewith and the second being mounted fixedly on said vertical track member, said pair of pulleys defining therebetween the path of travel of said vertical motion carriage;

e. a cord attached to said vertical motion carriage and trained about said pair of pulleys, thereby forming a loop including said vertical motion carriage;

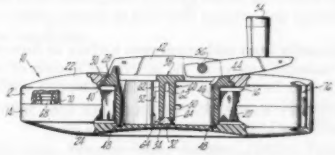
f. control lever means pivotally mounted on said vertical motion carriage with a distal lever arm thereof within the reach of the hand of a draftsman grasping said drafting head and with a proximal lever arm thereof engaging said cord, whereby applied force displacing said distal lever arm with following displacement of said proximal lever arm effects a shortening of said loop through a minimum loop length, thereby displacing said lever arm-mounted pulley through a maximum with concurrent maximum displacement of said braking member and separation between said brake shoe and horizontal track member; and

g. stop means limiting the displacement of said control lever means beyond the position of said minimum loop length to a distance which is less than the displacement distance from the position of brake shoe engagement with said horizontal track member to said position of minimum loop length.

3,908,277
TAPE MEASURE

Edward Charles Rutty, Portland, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Apr. 22, 1974, Ser. No. 462,668
Int. Cl.² G01B *3/10;* **B65H** *75/16;* **F16D** *63/00*
U.S. Cl. 33—138 **11 Claims**



1. In a tape measure, the combination comprising a casing, having a lip portion a reel member mounted on the casing for rotary motion relative thereto, a relatively long tape wound within the casing and having one end extending from said casing, a center post within the casing, said reel member having a central shaft extending coaxially toward the center post for engagement therewith and a rim radially spaced from the shaft for engagement with the lip portion of the casing, one of said central shaft and said center post being segmented to define a plurality of leg portions having free ends and the other of said shaft and post having a cam surface, said free ends bearing against said cam surface to urge said leg portions apart and thus provide an axial thrust to the reel within the casing and simultaneously provide constant frictional engagement between the rim of the reel member and the lip of the casing for resisting said axial thrust and rotary movement of the reel member with respect to the casing.

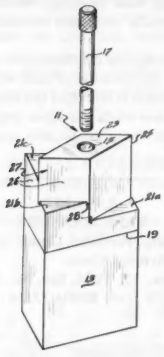
3,908,278
CALIBRATION BLOCK

Edwin G. Sundahl, Downers Grove, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 21, 1974, Ser. No. 453,604
Int. Cl.² G01B *3/30*
U.S. Cl. 33—168 R **3 Claims**

1. In an integral calibration block having a base surface, a plurality of stepped measuring surfaces and an uppermost measuring surface, said block having a longitudinal axis passing through said base and uppermost surfaces, said measuring surfaces facing opposite to said base surface and defining measuring values comprising the spacing between said base and each of said measuring surfaces, the improvement wherein each of said stepped surfaces having one recessed groove across the innermost margin thereof and being atop one of a plurality of peripheral, columnar segments of progressively increasing height in an upwardly spiral-like sequence about said longitudinal axis of said block from said base sur-

face to said uppermost surface, said uppermost surface being completely bounded by the upper edges of flat vertical surfaces, one of said vertical surfaces extending downwardly from said uppermost surface to one edge of said base surface and each of the remaining of said vertical surfaces extending



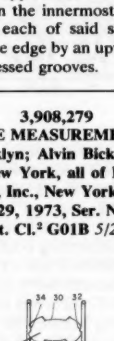
downwardly from said uppermost surface to form one side of said recessed groove in the innermost margin of one of said stepped surfaces and each of said stepped surfaces being bounded along only one edge by an upwardly extending vertical surface at said recessed grooves.

3,908,279

CURVATURE MEASUREMENT DEVICE

Wilfred Yoslow, Brooklyn; Alvin Bicker, East Setauket, and Mark L. Yoslow, New York, all of N.Y., assignors to Wilmark Electronic Co., Inc., New York, N.Y.

Filed Aug. 29, 1973, Ser. No. 392,489
Int. Cl.² G01B *5/20*
U.S. Cl. 33—174 L **19 Claims**



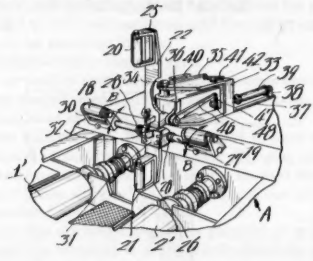
1. A curvature measurement device comprising an elongated flexible member, at least one pair of substantially parallel sensing wires extending longitudinally along said member, the wires of said at least one pair being disposed on opposing sides of said member and together defining a plane, said member including retaining means for maintaining said wires substantially coextensive with said member along the lengths thereof and each of said wires of said at least one pair being fixedly connected at one end thereof to said member and having the other end thereof free for longitudinal displacement along said member within said plane, whereby flexing of said member within said plane causes the free ends of said at least one pair of sensing wires to be displaced relative to each other in opposing directions along said member; and deviation means coupled to said free ends for producing an electrical signal proportional to the change of relative longitudinal positions of said free ends of a respective pair of sensing wires to thereby provide a measure of curvature within the respective plane.

3,908,280

ROLLER DRIVE-TYPE COMPOUND VEHICLE WHEEL ALIGNMENT TESTER

Kunihiko Murakami, Tokyo, and Reiken Kaneda, Kawasaki, both of Japan, assignors to Banzai Jidosha Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1973, Ser. No. 415,173
Claims priority, application Japan, July 24, 1973, 48-82662
Int. Cl.² G01B *3/12*
U.S. Cl. 33—203.13 **3 Claims**



1. A roller drive-type compound vehicle wheel alignment tester comprising a pair of wheel alignment measuring units each including detection rollers adapted to rotate in contact with sides of vehicle wheels, characterized in that each of said wheel alignment measuring units comprises a horizontally movable and tiltable cross-shaped detection roller support member having four arms, two toe-in detection rollers supported respectively on two of said arms of the roller support member, two camber detection rollers supported respectively on the remaining two arms of said roller support member, with the projection of the axes of said two toe-in detection rollers intersecting the projection of the axes of said two camber detection rollers and with the projections of the axes of said toe-in and camber detection rollers intersecting the projection of the axis of one vehicle wheel to be measured, said toe-in detection rollers or camber detection rollers being rotatably mounted on said support member and the other detection rollers being rotatably mounted on said support member for movement by a small angular distance so as to contact one side of said vehicle wheel under a uniform pressure, a horizontally movable frame tiltably supporting said detection roller support member for movement therewith toward and away from said vehicle wheel under a certain force, said horizontally movable frame having a vertical shaft, a horizontally rotatable frame mounted in said horizontally movable frame for horizontal rotation about said vertical shaft and having a horizontal shaft about which said roller support member is tiltable, means for indicating inclination angle of said roller support member with respect to said horizontally rotatable frame and means for indicating horizontal rotation angle of said roller support member with respect to said horizontally movable frame.

3,908,281

REAL ESTATE APPRAISAL INSTRUMENT AND METHOD

Michael C. Fox, 4951 14th St. South, Arlington, Va. 22206

Filed Jan. 29, 1973, Ser. No. 327,805
Int. Cl.² G01C *15/00, 3/00*
U.S. Cl. 33—228 **1 Claim**

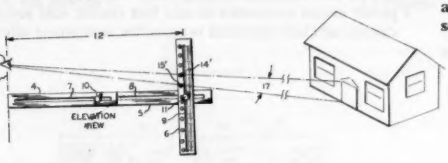
1. The method of remotely measuring dimensions of a structure such as the width or height of a building from a distance that may vary within predetermined limits, comprising the steps of,

a. establishing a pair of index markers separated by a predetermined distance,

b. establishing by selection a position spaced a predetermined distance from said markers as an apex point for an index angle identified by said markers by subtending with

said index angle a member of known dimension on said structure, such as a door, from an observation point,

c. subtending from said observation point and said apex point an unknown dimension on said structure by a measuring angle,



d. establishing a pair of measuring markers at the same said predetermined distance from said apex point as said index markers identifying said measuring angle, and

e. proportioning said index angle to said measuring angle to determine the unknown dimension.

3,908,282

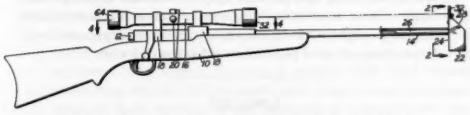
SIGHTING IN APPARATUS FOR RIFLE MOUNTED TELESCOPE GUNSIGHTS

Walter J. Steffan, 17838 S.E. Lincoln St., Portland, Oreg. 97233

Filed Mar. 18, 1974, Ser. No. 451,830

Int. Cl.[2] F41G *1/54;* **G01C** *25/00*

U.S. Cl. 33—234 **8 Claims**



1. Sighting in apparatus for rifle mounted telescope gunsights comprising

a. a sighting gauge having top and front edges,

b. rod-like support means projecting from the front edge of said gauge and arranged to be rotatably received in the muzzle end of a rifle barrel,

c. said support means extending from said gauge above the center of gravity of the latter whereby to form a pendulus support for the gauge to hold it precisely vertical when mounted in the rifle barrel,

d. a sighting target mounted on the front edge of said gauge having intersecting vertical and horizontal reference lines to be used in sighting in the telescope gunsight,

e. means arranged to adjust said sighting target vertically for setting the latter to the proper position for sighting in the telescope gunsight,

f. lens means for focusing the gunsight to the sighting target when the latter is supported on the muzzle end of the barrel,

g. a holder for said lens means arranged to be removably mounted on the front end of the telescope gunsight for supporting said lens means at the front of the gunsight,

h. and a transverse wall in said holder having a peephole centrally thereof for cooperation with the sighting means of the telescope gunsight and said sighting target for sighting in the gunsight.

3,908,283

ADAPTER FOR HEADLAMP AIMING MECHANISM

Lee K. Irwin, Emporia, Kans., assignor to Hopkins Manufacturing Corporation, Emporia, Kans.

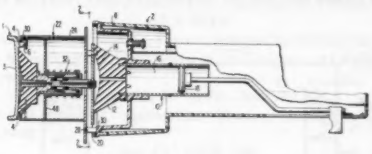
Filed Sept. 14, 1973, Ser. No. 397,368

Int. Cl.[2] G01B *5/25*

U.S. Cl. 33—288 **16 Claims**

1. An adapter unit for use with a vehicle headlamp aiming unit that is operable to test the alignment of a first headlamp; the aiming unit having holding means for holding the aiming unit against a surface, and aimer seating surface means capable of orienting the aiming unit with respect to corresponding reference surfaces; said adapter unit being operable to adapt the aiming unit to test the alignment of a second headlamp, diverse from said first headlamp, said adapter unit comprising:

adapter seating surface means corresponding to reference surface means of the diverse headlamp being tested;



adapter reference surface means corresponding to the aimer seating surface means;

means operable to be acted upon by holding forces generated by the aimer holding means for securing the aiming unit to said adapter unit; and

means for transmitting said holding forces generated by the aimer holding means to hold said adapter unit against the diverse headlamp.

3,908,284

METHOD OF AND APPARATUS FOR HEAT TRANSFER IN A FLUIDIZED BED

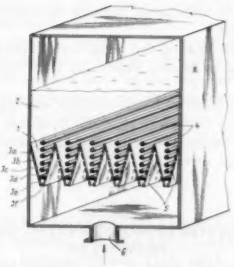
Jaroslav Beranek, Prague; Milos Kaspar, Jirkov; Vladimir Bazant, Prague, and Antonin Chladek, Jirkov, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Sept. 28, 1972, Ser. No. 293,024

Claims priority, application Czechoslovakia, Sept. 29, 1971, 6916-71

Int. Cl. F26b *3/08, 17/10;* **B01j** *9/18*

U.S. Cl. 34—10 **7 Claims**

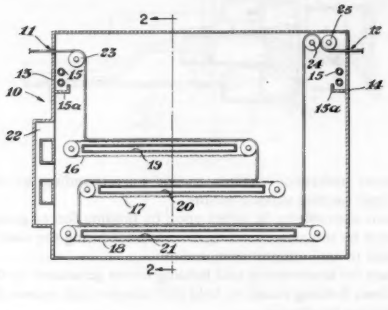


1. Apparatus for creating a fluidized bed of particulate material and for exchanging heat therewith, comprising an enclosure defining a compartment, a fluidized bed-supporting grid disposed horizontally within the compartment intermediate the height thereof to divide the compartment into upper and lower sub-compartments, means to introduce a fluidizing medium under pressure into the lower sub-compartment, the grids having a plurality of channels therein with sidewalls, there being a plurality of holes through the sidewalls of the channels whereby to introduce said fluidizing medium into the bed through the holes, and a plurality of conduits for heat exchange fluid disposed at different heights in the channels in the grid.

3,908,285
APPARATUS FOR SOLVENT REMOVAL

Richard A. Ryan, Eddington, and Vincent A. Galeone, Warrington, both of Pa., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 19, 1973, Ser. No. 426,149
Int. Cl.[2] F26B *21/06*
U.S. Cl. 34—77 **1 Claim**



1. An apparatus for removing solvent from a material and recovering the solvent so removed, which comprises:

a. an enclosure having a means of ingress and egress to its interior, a series of condensing coils about the inner periphery below the ingress and egress and a trough below said coils for collecting condensate;

b. a series of endless horizontal belts forming belt loops, one below the other, positioned below the said trough, to receive the material from the ingress means, move it transversely across the enclosure and drop it onto the next lower belt, the lowest belt extending beyond the other belts and having a direction of travel towards the egress and associated with pick-up means for the material for movement to the egress;

c. a means for introducing a vapor into the enclosure below the condensing troughs;

d. a means for withdrawing vapor from the enclosure, said means being positioned within the belt loops to cause vapors to be withdrawn through the material on the belt and the belt;

e. a means for heating the withdrawn vapors and means to return said so-heated vapors to said vapor introducing means;

f. means associated with said belts for moving said belts; and

g. means for delivering material from said ingress to said belts and means for removing said material from said belts to said egress.

3,908,286
APPARATUS FOR DEMONSTRATING GROUNDING PRINCIPLES

Joseph M. Dean, 671-63rd St., Des Moines, Iowa 50312, and Kenneth G. Olson, 3518 48th Street Place, Des Moines, Iowa 50310

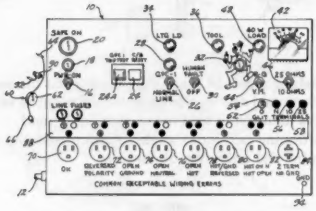
Filed Nov. 12, 1973, Ser. No. 414,678
Int. Cl.[2] G09B *23/06*
U.S. Cl. 35—19 A **3 Claims**

1. An electrical grounding demonstrator comprising;

a first circuit having an indicator light representing a human ground fault situation, said first circuit having a ground fault circuit interrupter therein, first switch means being in said first circuit for alternatively switching said ground fault circuit interrupter into and out of said first circuit, a second circuit having two resistors therein, said resistors having different predetermined resistance values, a volt meter being in said second circuit, and second switch means for connecting said volt meter alternatively across each of said resistors to measure the respective voltage drops across said resistors,

a plurality of electrical receptacles, each of said receptacles being wired differently to illustrate various wiring errors, one of said receptacles being wired correctly,

a power circuit connected to said first circuit, said second circuit, and said electrical receptacles, said power circuit



having a safe-on switch for selectively introducing power to said circuits,

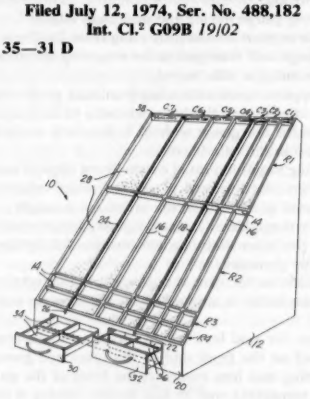
a ground loop impedance tester having a probe,

a plurality of ground loop impedance terminals for selectively receiving said ground loop impedance tester probe, each of said terminals being connected at various points in said power circuit to illustrate variations in ground loop impedance at said points in said power circuit.

3,908,287
MATHEMATICS VISUAL TEACHING AID

Eula K. Darnell, 307 Baldwin, West Helena, Ark. 72390

Filed July 12, 1974, Ser. No. 488,182
Int. Cl.[2] G09B *19/02*
U.S. Cl. 35—31 D **12 Claims**



1. A mathematics visual aid useful in teachin the importance of the place-value components 1, 10, 100, ... , 10^n (n=0, 1, 2, . . .), which comprises:

a support member:

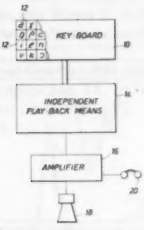
divider means formed on a surface of said support member for defining a plurality of columns of work areas and at least first and second rows of work areas; and

a plurality of sets of workpieces, the number of said sets corresponding to the number of said columns of work areas, each of said columns having a unique set of workpieces associated therewith, all the workpieces within each of said sets sharing a common physical configuration which differs from the common physical configuration shared by the workpieces in each of the other sets.

3,908,288
TEACHING DEVICE

Cecil Brown, Jr., P.O. Box 1, Friendswood, Tex. 77546

Filed Nov. 19, 1973, Ser. No. 417,137
Int. Cl.² G09B 5/04; G11B 15/18
U.S. Cl. 35—35 C 12 Claims

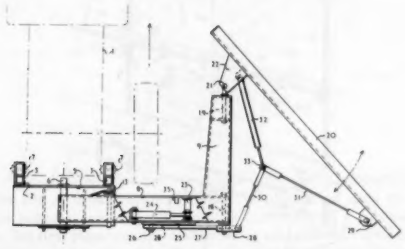


1. A teaching device comprising:
sound recording means having a plurality of individual sound units recorded thereon;
sound detecting means for selectively detecting the sound units recorded on said sound recording means;
amplifier and sound reproducing means for amplifying and audibly reproducing the sound units detected by said sound detecting means;
actuator means comprising a plurality of key members, said actuator means being operatively connected to said sound recording means and to said sound detecting means and including means operative upon operation of each one of said key members to selectively operably connect said sound recording means with said sound detecting means and maintain said connection for a time span at least as long as the duration of a respective one of said sound units without the necessity for operating said key member for said duration to detect said respective one of said sound units irrespective of any prior operation of any of the other key members;
and means for preventing repetition of each of said sound units during one operation of the respective key member.

3,908,289
SWING-OVER SNOW WING

Joseph Ross, 1201 Fell St., Nelson, British Columbia, Canada

Filed June 3, 1974, Ser. No. 475,411
Int. Cl.² E01H 5/06
U.S. Cl. 37—41 10 Claims

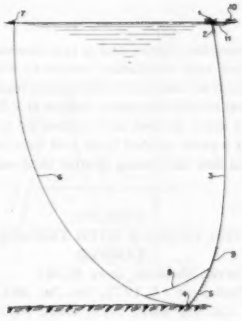


1. For a vehicle such as a grader or the like, a swing-over snow wing, for operation on either side of such vehicle, including a radial arm rotatably mounted at one end on a horizontal axis extending longitudinally from the rear of the vehicle, the other end of said arm extending laterally beyond the side of the vehicle; an elongated two-way wing blade horizontally hinged about an axis extending forwardly alongside the vehicle on said other end of said arm, said blade extending forwardly of the rear of said vehicle and alongside thereof; and means for rotating said arm about said horizontal axis through approximately 180° to swing said two-way wing blade over the vehicle from one side thereof to the other.

3,908,290
HYDRAULIC DREDGING SYSTEM AND METHOD FOR COLLECTING AND REMOVING MATERIAL FROM DEEP SEA BEDS

Elie Condolios, Grenoble, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), Grenoble, France

Filed June 22, 1973, Ser. No. 372,516
Claims priority, application France, June 22, 1972, 72.23440
Int. Cl.² E02F 3/88
U.S. Cl. 37—58 8 Claims



1. A hyraulic dredging installation for collecting and vertically removing materials at a high solid flow rate, particularly at great depth, from the floor of the sea, comprising a first ship for receiving said materials, a material removing tube pivotally connected to said first ship and extending substantially vertically therefrom to the floor of the sea, material collecting means disposed on the floor of the sea and connected to said material removing tube for gathering materials from the sea bed and inserting them into said tube, a second ship for towing said material collecting means, a tow cable extending from said second ship and being directly connected to said material collecting means on said floor of the sea and means for increasing the distance between said first and second ships such that said second ship effects at least partial raising of said material collecting means by the direct connection thereby during movement of said second ship.

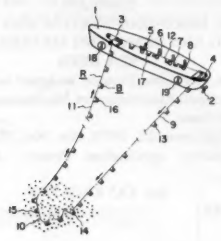
3,908,291
APPARATUS FOR PREVENTING TANGLE OF ENDLESS ROPE IN MINING OR SEA LIFE GATHERING

Yoshio Masuda, Kohdan Jutaku 31-1, 10-1, Tamadaira 4-chome, Hino, Tokyo, Japan

Filed Dec. 27, 1973, Ser. No. 428,834
Claims priority, application Japan, Jan. 23, 1973, 48-9166; Mar. 13, 1973, 48-28531
Int. Cl.² E02F 3/14; A01K 74/00, 79/00
U.S. Cl. 37—69 9 Claims

1. A mechanism for continuously mining metallic nodules from the deep sea-bottom comprising:
an endless rope;
a ship having a bow and a stern;
a plurality of buckets attached to said rope at intervals;
driving means for circulating said rope to descend and ascend from the stern of said ship at a fixed speed;
a plurality of resistance means attached at invervals to said rope to circulate with said rope for increasing the dis-

tance of separation of said ascending and descending portions of said rope in response to the water flow generated by the forward movement of the ship at a fixed speed; and



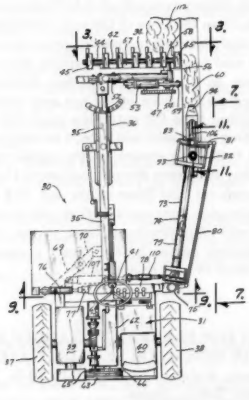
a front connector means and a rear connector means for connecting said resistance means to said rope at two points, each of said connector means includes a first arm connected to said resistance means at a first point and to said rope and a second arm connected to said resistance means at a point spaced from said first point and to said rope, said first arm being shorter than said second arm.

3,908,292

ARTICULATED VEHICLE WITH TRENCH FILLER AND TAMPER

Marvin K. Harris, Sheldahl, Iowa 50243

Filed June 14, 1973, Ser. No. 369,891
Int. Cl.² E02F *5/22;* **E01C** *19/34*
U.S. Cl. 37—142.5 **8 Claims**



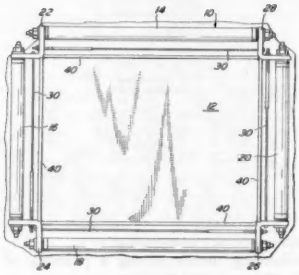
1. A device for filling and tamping a trench comprising:
a vehicle having a pivotable boom with a steerable wheel at its forward end, said pivotable boom being connected to said vehicle at a substantially vertical pivot point;
arm means pivotally connected to said vehicle at one end thereof about a vertical pivotal point;
a reciprocating tamping unit supported from the other end of the arm means; and
a drag conveyor means pivotally mounted to said pivotable boom along a substantially vertical axis, whereby said tamping unit and said conveyor means are independently adjustable laterally with respect to said vehicle.

3,908,293

SCREEN TENSIONING AND PRINTING FRAME

Don Newman, Philadelphia, Pa., assignor to Stretch Devices, Inc., Philadelphia, Pa.

Filed Sept. 19, 1974, Ser. No. 507,301
Int. Cl.² D06C *3/08*
U.S. Cl. 38—102.91 **16 Claims**



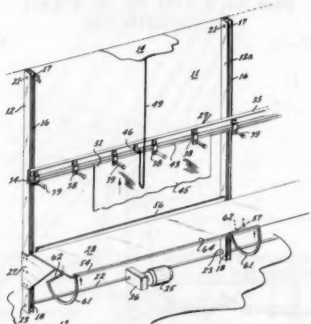
1. Apparatus comprising a screen tensioning and printing frame, said frame having a plurality of rollers coupled together by corner members which support the rollers for rotation about their longitudinal axes, each roller having a longitudinally extending channel on its periphery, a retainer for each channel to retain an edge portion of a screen fabric in each channel, means associated with each corner member for locking each roller in a predetermined rotative position so that a desired tension may be applied to a screen fabric, means for applying a camber to each roller, and a dam member associated with each roller, each dam member being inwardly of its associated roller and extending between adjacent corner members so that the dam members and corner members form a dam for a printing medium to be applied through a screen fabric.

3,908,294

DEVICE FOR TABLING LENGTH OF DRAPERIES

Donald R. Russel, 1550 Sansinena Ln., La Habra, Calif. 90631

Filed Apr. 1, 1974, Ser. No. 456,662
Int. Cl.² D06F *81/00*
U.S. Cl. 38—104 **16 Claims**



1. A layout table for laying out and measuring cloth comprising:
a working table means forming a surface disposed substantially horizontal;
first means for lifting vertically said cloth on one edge thereof so that said cloth depends to said surface and has a portion resting on said surface; and

second means for forming and holding a dihedral angle in said cloth, with one surface of said cloth held in the plane of said surface of said table means while the other surface of said angle depends vertically.

3,908,295

SWITCH-PROOF TICKET SYSTEM AND METHOD

John S. Dudley, Douglas, and Ralph E. Hollis, Southboro, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 331,593, Feb. 12, 1973, abandoned. This application Jan. 21, 1974, Ser. No. 434,959
Int. Cl.[2] G09F *3/12*
U.S. Cl. 40—25 21 Claims

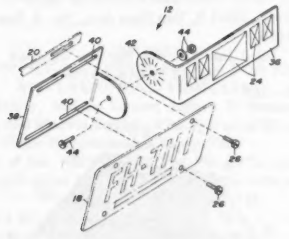
1. In a switch-proof ticket system a ticket having a bend line to facilitate bending of a portion of the ticket with respect to the remainder of the ticket and a pin penetrable through the ticket and having a tip, a shank and a head, said pin having a break groove in a portion of the shank, and said pin is positioned in the ticket so that it first penetrates one side and extends beyond the opposite side and then repenetrates the opposite side of the ticket and extends beyond the one side of the ticket with the break groove positioned in substantial alignment with the break line so that when a portion of the ticket on one side of the bend line is rotated, relative to the remainder of the ticket, a portion of the pin rotates therewith and breaks into two parts at the groove.

3,908,296

METHOD AND APPARATUS FOR DISPLAYING DECALS

Gene C. Harrison, c/o Quarters W-Naval Training Center, Bainbridge, Md. 21905

Filed Apr. 29, 1974, Ser. No. 464,776
Int. Cl.[2] G09F *7/00*
U.S. Cl. 40—210 10 Claims



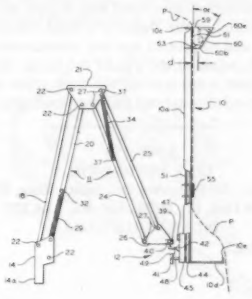
1. A decal mount for motor vehicles comprising a mounting means for attaching a decal mount to a selected area of a motor vehicle, said mounting means consisting of a substantially flat first plate means attachable to said selected area for supporting a license plate thereon and a first flange means extending from an end thereof substantially normal to a front face of said mounting means, a decal display surface connected to said mounting means for supporting a decal adhesively secured thereto, said decal display surface consisting of a substantially flat second plate means removably secured to an end of said first plate means in off-set planar relationship, with said second plate means being pivotally secured to said first plate means for selective alignment of said display surface with respect to said mounting means, said second plate means also including a second flange means extending from an end thereof substantially normal to said display surface; and further including fastening means pivotally connecting said first and second flange means, whereby said display surface is selectively alignable with respect to said front face of said mounting means.

3,908,297

KEYBOARD OPERATOR SHEET HOLDING AND FEEDING DEVICE

Richard W. Schmutzler; Edgar S. Van Buren, and Gregory R. Waldron, all of Walton, N.Y., assignors to Scott Machine Development Corporation, Walton, N.Y.

Filed Apr. 17, 1974, Ser. No. 461,499
Int. Cl.[2] B41J *11/14*
U.S. Cl. 40—351 19 Claims



16. Apparatus for supporting a portion of a strip of paper sheet flat in a substantially vertical first plane at a viewing position for viewing by an operator and allowing successive portions of said strip to be readily fed to and past said viewing position by direct manual manipulation of said strip, comprising, in combination: a first member having a first surface; means for supporting said first member to dispose said first surface in said first plane at said viewing position; a second member supported on said first member, said second member having a second surface spaced from and sloping downwardly toward said first surface to provide a trough having lower and upper openings; and revolvable and vertically-translatable wedging means lying within said trough, whereby in the absence of a portion of said strip between said first and second members gravity will cause said wedging means to revolve and lower within said trough to rest against said surfaces, insertion of said strip upwardly into said trough through said lower opening will upwardly displace said wedging means against the force of gravity to allow said strip to be moved upwardly through said trough and out said upper opening, and said retaining means will wedge said strip against said first surface, preventing downward movement of said strip through said trough.

3,908,298

FISHING LURE

James W. Strader, P.O. Box 4029, Tallahassee, Fla. 32303

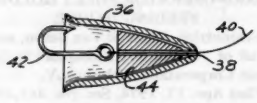
Continuation of Ser. Nos. 362,067, May 21, 1973, abandoned, and Ser. No. 196,850, Nov. 8, 1971, abandoned. This application Sept. 30, 1974, Ser. No. 510,815
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.05 4 Claims

1. A fishing lure including the combination of a bait protector and noise maker comprising;

a generally conical body member, said conical body member having a bait protector portion in the rear thereof for protecting bait on the shank of a hook adjacent the hook

eye, a generally central line conduit in the anterior portion of said conical body member which is designed to accommodate the fishing line in slidable relationship,

a noise making weight means, said weight means shaped to be disposed within said conical body member and movable on the line when the line in the anterior portion of the conical body member is moved relative to said conical body member, said weight means lowering the lure when



in the water and makes a clacking noise when moved into and out of contact with said conical body member, and

said bait protector portion sized and shaped to receive the eye and portion of the shank of a hook when connected to the line and to protect the bait placed over the shank of the hook adjacent the eye of the hook, whereby said end of the bait is not torn off the hook when the lure and hook is moved through an aquatic weed area.

3,908,299

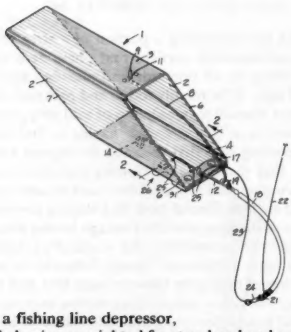
LINE DEPRESSOR

Karl H. Kalberer, 85 Somerset Dr., Santa Rosa, Calif. 95401

Filed Oct. 11, 1974, Ser. No. 514,327

Int. Cl.[2] A01K *95/00*

U.S. Cl. 43—43.13 **14 Claims**



1. In a fishing line depressor,

a body having a weighted front rod end and a rear hook end, respectively closer to the fishing rod and to the hook-line portion of the fishing line,

at least one hydrodynamic surface on said body

a curved guide extended from the front rod end of said body upwardly and rearwardly with respect thereto,

a longitudinally and resiliently expandable line having one end thereof slidable on said curve guide between front and rear positions,

a rod-line portion of the fishing line connected to the other end of said expandable line,

a trip-line connected at one end to said body remote from said one end of said expandable line and at its other end to said rod-line, said trip-line being longer than said expandable line so as to be initially slack when said expandable line is in the rear position on said guide and is stretched to a sufficient length when a predetermined force is exerted thereon to pull said trip-line taut thereby causing said expandable line to slide to its front position and thereby tripping said body with said hydrodynamic surface substantially parallel with said rod line, thereby diminishing resistance to pulling the line out of the water.

3,908,300

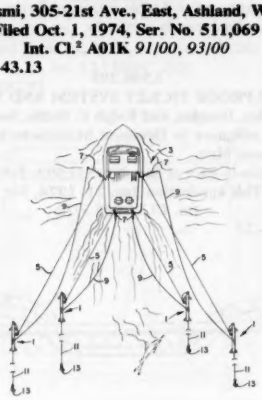
TROLLING RIG

Gust M. Kuismi, 305-21st Ave., East, Ashland, Wis. 54806

Filed Oct. 1, 1974, Ser. No. 511,069

Int. Cl.[2] A01K *91/00, 93/00*

U.S. Cl. 43—43.13 **16 Claims**



1. A trolling ski adapted to be towed along the surface of the water by a towing medium, said ski being formed of a buoyant material, a fishing leader extending from a fishing rod to said ski and from said ski into the water for towing behind said ski and a lure fixed on the end of said leader in the water, mechanism provided on said ski for releasably attaching said leader to said ski, a tow line fixed at one end to the towing medium and at the other end to the bow of said ski, means provided on said ski for releasably attaching the tow line thereto, said means being spaced from the bow of the ski, the tow line being releasably attached to said means along its length between the fixed ends thereof, said being actuable to release said leader from said mechanism a fish strikes the lure, and actuating means extending between and operatively connecting said mechanism and said first named means together, said actuating means being actuable when said mechanism is actuated to release said leader therefrom and the actuation of said actuating means causing substantially simultaneous operation of said first named means releasing the tow line therefrom so that the ski will then be towed from the bow thereof.

3,908,301

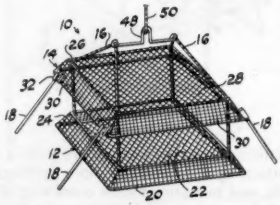
LEG SUPPORTED CRAB TRAP

Nilson V. Ortiz, 1064 S. Van Ness Ave., No. 4, San Francisco, Calif. 94110

Filed July 5, 1974, Ser. No. 486,140

Int. Cl.[2] A01K *69/10*

U.S. Cl. 43—105 **2 Claims**



1. A crab trap, comprising:

a pair of superposed rectangular planar frames each having a section of woven mesh sheet material extending between and secured to its respective marginal edges;

an inwardly and upwardly inclined endless woven mesh sheet material enclosure forming wall secured at its depending limit to the upper marginal edge surface of the lowermost said frame for forming a ramp permitting the entry of crabs to the enclosure;

leg means secured in depending relation to the uppermost said frame for maintaining the latter in parallel spaced relation above the lowermost said frame when said frames are disposed on a substantially planar supporting surface a flexible hoist strand connected, at one end, with the respective marginal side of the lowermost frame and extending cooperatively upward through the woven mesh material of the uppermost said frame; and,

a depending endless woven mesh material wall secured to the perimeter of the uppermost said frame in downwardly and outwardly diverging relation for contiguous contact with said enclosure forming wall when said frames are lifted by said strand.

3,908,302

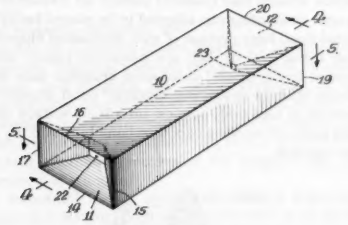
ROACH TRAP

Richard V. Carr, Naperville, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed May 28, 1974, Ser. No. 474,117

Int. Cl.[2] A01M *1/10*

U.S. Cl. 43—121 **3 Claims**



1. A roach trap comprising an elongated rectangular prismatic housing, having a truncated pyramid-shaped entranceway at each end of the housing extending toward the interior of said housing, the outer edge of each of said entrance-ways being substantially congruent with the periphery of the ends of said housing, the first of said entrance-ways having a rectangular opening at its vortex, the sides of which have a dimension of from about three-fourths to about seven-eighths inch, and the second of said entrance-ways having a rectangular opening at its vortex, the sides of which have a dimension of from about three-sixteenths to about three-eights inch.

3,908,303

SHIFT CONSOLE INCLUDING MEANS FOR FEEDING AND LAUNCHING VEHICLES

Robert S. McKay, Morton Grove; Jeffrey D. Breslow, Highland Park, and Marvin I. Glass, Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Continuation of Ser. No. 302,251, Oct. 30, 1972, abandoned. This application July 15, 1974, Ser. No. 488,301

Int. Cl.[2] A63H *17/00*

U.S. Cl. 46—1 K **9 Claims**

1. A toy vehicle launching device comprising:

means defining a shift console including a wall having an H-shaped slot formed therein;

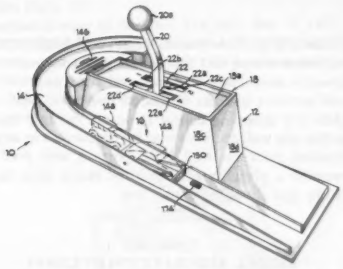
a hand manipulatable shift stick received in said slot and movably mounted to said console for movement through said slot;

means defining a launching station for receiving a toy vehicle preparatory to launching;

launching means operably connected to said shift stick for launching a toy vehicle from the launching station in response to a predetermined sequence of shift stick movements in said slot, said launching means including a cocking plate movably mounted in said console and associated with said shift stick for movement in response thereto, said cocking plate being rapidly movable between an unbiased or released position to a biased or cocked position in response to the movement of the shift stick in said shift sequence, biasing means associated with said cocking plate for urging said cocking plate toward the released position, a plunger connected to said cocking plate extending outside of said console, said plunger propelling a toy vehicle from the launching station when said cocking plate is rapidly moved from a cocked position to a released position, retaining means operably associated between said cocking plate and said shift stick for holding said cocking plate in a cocked position before the completion of the shift movement sequence and for releasing said cocking plate at the end of said sequence thereby allowing said cocking plate to move rapidly between the cocked and released positions;

an inclined toy vehicle feeding track for holding a plurality of vehicles single file thereon adjacent the launching station; and

feeding means associated with said launching means intermediate said feeding track and said launching station for



feeding the vehicles on the track to the launching station one at a time after the previous vehicle has been launched therefrom and wherein said feeding means includes a rear gate associated with said launching means for normally blocking the first vehicle on said track from moving to the launching station, said rear gate being movable in response to the actuation of said launching means between a normal raised position blocking said first vehicle and a lowered position allowing said first vehicle to move thereover toward said launching station, and a forward gate associated with said launching means for holding a toy vehicle between it and said rear gate on said launching station, said forward gate being movable in response to the actuation of said launching means between a normally lowered position wherein a vehicle can move thereover to the launching station and a raised blocking position wherein a vehicle is blocked from moving to the launching station, said foward gate being in its normal lowered position when said rear gate is in its normal raised position and said forward gate being in its raised position when said rear gate is in its lowered position.

3,908,304

COLLAPSIBLE SHOPPING CENTER TOY WITH COLLAPSIBLE MOVABLE WALL SECTIONS

Michael J. Crahan, 10934 Southview Dr., Burnsville, Minn. 55337, and Daniel A. Bergeron, 5717 31st Ave. South, Minneapolis, Minn.

Filed Mar. 29, 1974, Ser. No. 456,045

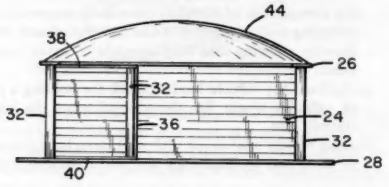
Int. Cl.[2] A63H *33/42*

U.S. Cl. 46—12 **1 Claim**

1. A toy simulating in miniature a shopping center, said toy comprising:

a base portion; and a roof portion; and collapsible wall structures vertically extendable and attached to said base and roof portions; and support means mountable between said base and roof portion to maintain said wall structures in their extended positions, said support means compris-

ing a plurality of elongated brackets of L-shaped cross section which can be positioned at the corners formed by the adjacent edges of two perpendicular vertically extended ones of said wall structures to cover any gap existing thereat while maintaining the roof portion extended from the base portion; thereby forming a representation of a shopping center structure; and a plurality of individual, collapsible wall sections each having a bottom, a top, and vertically extendable, collapsible wall



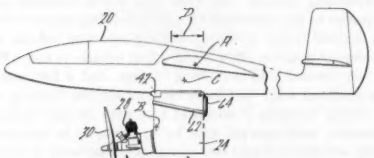
portions of predetermined length and height attached to said bottom and said top; and support means mountable between respective bottoms and tops to maintain said wall sections in their extended positions, said wall sections and shopping center structure being proportioned so that the wall sections may be positioned in any desired location between said base portion and roof portion whereby a plurality of individual stores may be formed within said shopping center toy.

3,908,305

MODEL AIRCRAFT PROPULSION

Lloyd A. Schroeder, 5391 Robinwood Dr., North Street, Mich. 48049

Filed Dec. 7, 1973, Ser. No. 422,688
Int. Cl.[2] A63H *27/02, 33/20*
U.S. Cl. 46—74 R **32 Claims**



32. A propulsion source for a model aircraft comprising: a power pod releasably coupled with the model aircraft; a parachute contained within said pod for deployment upon separation of the pod from the model aircraft; and means for deploying the parachute comprising a rip cord connected between the parachute and the model aircraft, said rip cord including a replaceable, breakable link.

3,908,306

TOY INERTIAL PROJECTILE LAUNCHER

Harry Arthur Petersen, 2526 Tomoka Ave.; Mike Kinnan, 3645 Barna Ave., Apt. 29B, both of Titusville, Fla. 32780 and Frederick Drew Evans, Jr., Rt. 1, Oviedo, Fla. 32765

Filed Apr. 18, 1974, Ser. No. 462,033
Int. Cl.[2] A63H *5/00*
U.S. Cl. 46—199 **1 Claim**

1. An amusement projectile launching device comprising, in combination:

a. a body section shaped like a cone frustum, smaller at the top, and constructed of a solid, rigid material adapted to transmit inertial shock;

b. a handle means affixed to one side of said body section;

c. said handle means being cylindrical in shape having a similar, but larger in diameter, cylinder as a handgrip;

d. a detonation chamber, cylindrical in shape, located in the top of said body section;

e. said detonation chamber being comprised of metal-lined walls and base, having its top open, and at the same level as the top of said body section;

f. a toy projectile adapted to be placed atop said body section and inserted into said detonation chamber;

g. said toy projectile having a bottom extending downward in the shape of a piston;

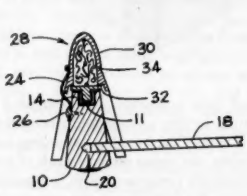
h. said piston being sized to fit snugly into said detonation chamber, and having at its base a metal end which mates with said metal-lined base portion of said detonation chamber;

i. said toy projectile having a top section in the shape of a rounded dome;

j. a minimum of three semi-rigid vanes, evenly spaced radially and integrally formed with said rounded dome, and extending outwardly and downwardly to form a conical shape;

k. said vanes being straight longitudinally, and evenly dispersed around said rounded dome's aft circumference;

l. a paper detonating cap adapted to be placed between said metal-lined base portion of said detonation chamber and said metal end of said toy projectile piston such that inertial forces of said detonation chamber base and said piston sharply squeezing together upon impact of the bottom of said body section on a hard surface detonate said paper detonating cap, thus launching said toy projectile upward;



m. an impact distribution plate shaped like an ordinary thumbtack affixed to the center-bottom of said body section by a force fit;

n. a toy parachute housed, during launch and part of the flight, in a modified rounded dome section of said toy projectile wherein the rounded dome section forms an aerodynamic parachute housing which is hollow with a raised shoulder on the inner diameter of the hollowed section base;

o. a cap, integrally formed with said piston and adapted to be received on said shoulder to form the bottom section of said hollow parachute housing;

p. said cap being loosely fitted on said shoulder so that said aerodynamic housing and said cap will tumble apart at the top of said projectile flight, or zero gravity point, thus releasing said parachute;

q. said housing and said cap being attached by strings to the apex of the parachute shroud lines;

r. said hollowed portion of said projectile rounded dome being larger in diameter at its bottom end than at its uppermost end to allow said parachute to freely and easily tumble therefrom at the zero gravity point of projectile flight;

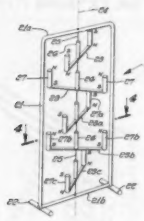
s. three spring wire clip retainers, spaced at **120** degree intervals radially around, and affixed on the side of said body section to hold said toy projectile in place during the launching thereof;

t. said spring wire clips are formed in a circular eyelet at their bottom end to permit affixing of said clips to said body section by wood screws.

3,908,307
MAGNETIC KINETIC AMUSEMENT DEVICES

Sava W. Jacobson, 4915 Tyrone Ave., Sherman Oaks, Calif. 91403

Filed July 26, 1974, Ser. No. 492,042
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—238 4 Claims

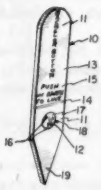


1. A magnetic kinetic amusement device comprising,
a frame,
plural magnetic elements, and
a plurality of mounting means supported by said frame, at least one magnetic element being mounted by each such means, said magnets thus being supported in spaced, magnetically coupled relationship so that motion of one mounting means intermittantly is interchanged magnetically with another such mounting means to produce intermittent alternating motion of the magnetically coupled means, and wherein;
each mounting means comprises an arm supported for rotational motion about an axis common to all such arms, there being at least one magnet affixed to each arm at a distance spaced from said common axis, so that rotational motion of one arm intermittently is coupled magnetically to another arm to cause rotational oscillation thereof.

3,908,308
SELF-STARTING PLANT MARKER AND METHODS AND APPARATUS FOR MAKING SAME

Edward F. Meyers, Oyster Bay, N.Y., assignor to Enviro-Gro, Inc., Smithtown, N.Y.

Division of Ser. No. 383,154, July 27, 1973, Pat. No. 3,846,954, which is a continuation-in-part of Ser. No. 256,365, May 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 297,202, Oct. 13, 1972, abandoned. This application Nov. 1, 1974, Ser. No. 520,054
Int. Cl.[2] A01C *1/04*
U.S. Cl. 47—56 8 Claims

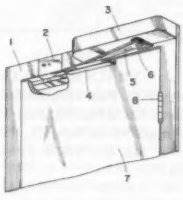


1. A self-starting plant marker comprising
a. an elongated peg means having upper and lower ends;
b. a soil level index means disposed between the ends of said peg means;
c. an opening in said peg means defining a seed plug carrying means spaced beneath said soil level index means a predetermined distance;
d. said predetermined distance being substantially equal to a predetermined planting depth for a selected seed;
e. identification means for the plant to be grown from said preselected seed disposed at the upper end of said peg means above said soil level index means; and
f. seed holding plug means in said opening and enveloping at least one selected seed therein, said plug means being firmly secured within and being generally conformed to the shape of said opening;
g. said plug means being formed from a vehicle means which is solid at ambient room temperature, which is paste-like at approximately 118°F., and which is free flowing at approximately 125°F.; and
h. said vehicle means being water soluble.

3,908,309
PARTICULATE PRODUCTS OF COMBUSTION DETECTOR FOR CLOSURE FRAME

Gordon L. Coulter, Arlington Heights, Ill., and Duane D. Pearsall, Morrison, Colo., assignors to Rixson-Firemark, Inc., Franklin Park, Ill.

Continuation-in-part of Ser. No. 216,202, Jan. 7, 1972, Pat. No. 3,777,423. This application Oct. 9, 1973, Ser. No. 404,311The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.
Int. Cl.[2] E05F *15/20*
U.S. Cl. 49—31 10 Claims



1. In a closure frame having a head member defining the top of a closure opening with the head member supporting an electrically actuated closure holder-closer, the improvement comprising a module including a frame shell section providing a module base and a detector for the particulate products of combustion supported on the interior of the frame shell section with access openings being formed in the shell section to enable particulate products of combustion to pass through the shell to the detector, a socket formed in the head member to receive the module whereby particulate products of combustion passing through the closure opening pass through the module access openings to actuate thereby the detector, and means electrically connecting the detector to the closure holder-closer to effect closing of an otherwise open closure in response to the actuation of the detector upon the detection of the products of combustion.

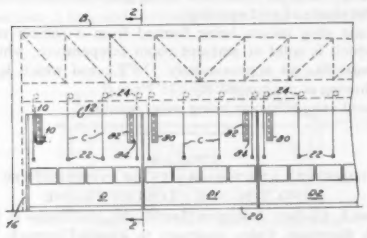
3,908,310
CANOPY DOOR

Charles S. Davidson, Troy, Mich., assignor to Byrne Doors, Inc., Ferndale, Mich.

Filed June 10, 1974, Ser. No. 478,005
Int. Cl.[2] E05D *15/40*
U.S. Cl. 49—205 12 Claims

1. A braced door construction for a building opening comprising a single leaf canopy door having a vertical dimension substantially equal to that of said building opening, said door being movable between a lower upright closed position extending from top to bottom of said opening and an upper substantially horizontal open position disposed near the top of said opening, operating and guiding mechanism for said door comprising means for raising said door from its lower to its upper position, a first guide fixed with respect to said building,

a follower mounted on the upper edge of said door and engaging said first guide for movement therealong, said first guide having a generally vertical portion engaged by said follower during initial opening movement of said door, a second guide fixed with respect to said building, a brace arm, first pivot means pivoted at one end of said brace arm to said door,

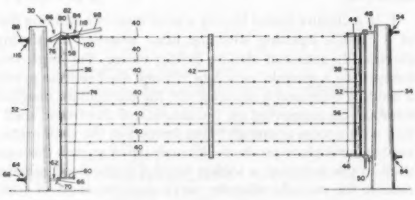


means at the other end of said brace arm engaging said second guide for movement therealong, a second arm, second pivot means pivoting one end of said second arm to the building, and third pivot means pivoting the other end of said second arm to said brace arm, said brace arm and said second arm forming an acute angle with one another in the closed position of said door.

3,908,311
TRACTION GATE

Felix B. Romberg, P.O. Box 218, Holland, Tex. 76534

Division of Ser. No. 270,308, July 10, 1972, Pat. No. 3,825,053. This application Nov. 21, 1973, Ser. No. 417,898
Int. Cl.² E06B *11/00*
U.S. Cl. 49—381 **11 Claims**



1. In a traction gate, the combination of:

a frame comprising a pair of upright end standards and a unitary longitudinal frame member integrally connected with and extending between the lower ends of said end standards,

means for hingedly supporting one end of the gate frame for laterally swinging movement between a closed position and an open position,

means for supporting the opposite end of said frame at the bottom against downward and lateral displacement when the frame is in the closed position,

a wire barrier tensioned between said end standards and tending to apply bending moment to said longitudinal frame member,

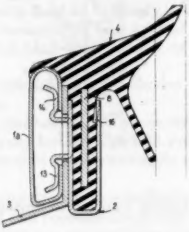
said wire barrier being positioned entirely above the longitudinal frame member of the frame whereby the longitudinal frame member comprises the lowermost structural element of the swingable portion of the gate; and

means for applying traction at the top of said frame above said bottom support means and thereby relieving the longitudinal frame member from said bending moment of said wire barrier.

3,908,312
SEAL AND DECORATIVE STRIP ASSEMBLY FOR SLIDING WINDOW OF VEHICLE

Jean-Claude Pennec, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Nov. 27, 1973, Ser. No. 419,272
Claims priority, application France, Dec. 6, 1972, 72.43344
Int. Cl.² E06B *7/16*
U.S. Cl. 49—493 **1 Claim**



1. A sliding-window seal for an automotive vehicle comprising a flexible plastic seal section member associated with at least one fastening clip and with a decorative strip having a substantially C-shaped cross-section for marking the junction between the seal and the lower, substantially vertical edge of the framing of a sliding glass of a vehicle, said flexible plastic seal section member having a fastening depending element, said fastening clip having a substantially U-shaped cross-sectional contour into which the fastening depending element of said flexible plastic seal section member is inserted, a portion of one arm of said U-shaped clip being cut and pressed to provide a pair of opposed lugs spaced from said one arm, a portion of the other arm of said clip being cut and pressed to provide a pair of transverse inclined claws extending inward of the clip and adapted to penetrate into said fastening depending element of the seal section member, said decorative strip and said fastening clip being assembled together and with the glass framing with the portion of said one arm extending through an elongated hole formed longitudinally along the marginal portion of said glass framing and extending through an open longitudinal slot of said C-sectioned decorative strip pressed against the opposite side of said glass framing and the lugs engaging the inner faces of the edges of said longitudinal slot of said decorative strip to thereby lock the assembly in its assembled condition.

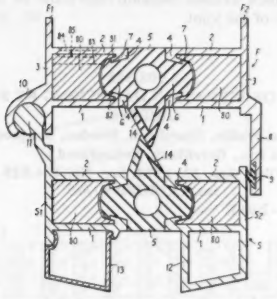
3,908,313
WINDOW ASSEMBLY

Johannes Harald Bierlich, Oresundshoj 15, Charlottenlund, Denmark

Continuation of Ser. No. 342,546, March 19, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,674
Claims priority, application United Kingdom, Mar. 21, 1972, 13226/72
Int. Cl.² E06B *1/32*
U.S. Cl. 49—501 **8 Claims**

1. In a thermal break window assembly comprising inner and outer frame parts made of metal extrusions and spaced apart by a member of thermal insulating material, said inner and outer frame parts each including an open channel section having inwardly facing abutments adjacent the free edges of the opposing channel side walls, the inner and outer metal frame parts being disposed with their open channel sections facing each other and connected in spaced relation by a spacer member made of a substantially rigid thermal insulating material and having opposite ends profiled in cross-section to fit between and having shoulders on each side to interlock behind opposing pairs of abutments to secure the frame parts

and spacer member together, the improvement which is characterized by each of said channel sections being made of springy metal and the channel side walls being of a depth such that the side walls can spring apart sufficiently to permit the shoulders of a profiled end of solid cross-section of the substantially rigid spacer member to be forced into the channel section between the pair of inwardly facing abutments thereof, and in that the profiled end of solid cross-section of the spacer member is gripped between said abutments by the spring action of the channel side walls with the shoulders interlocked behind the abutments.

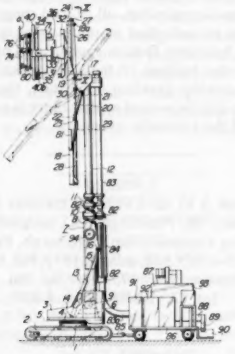


3,908,314

BLASTING DEVICE FOR CLEANING RELATIVELY LARGE SURFACES

Susumu Watanabe, Nagoya; Hiromu Sato; Toyoji Fuma, both of Toyokawa, and Hitoshi Takeda, Toyohashi, all of Japan, assignors to Sintokogio, Ltd., Japan

Filed July 5, 1974, Ser. No. 485,882
Claims priority, application Japan, July 12, 1973, 48-78606
Int. Cl.² B24C *3/06*
U.S. Cl. 51—9 M **16 Claims**



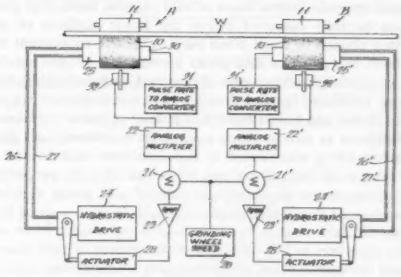
1. A blasting device including a vehicle, telescopic boom and a packaged blasting unit having an opening which is brought into tight contact with the surface to be cleaned and adapted to project an abrasive material through said opening onto said surface, comprising a first frame means having guiding arms pivotably mounted on the top end of said telescopic boom provided swingably on said vehicle, a second frame means engaged with said guiding arms and adapted to move along said g iding arms, supporting means provided on said second frame means, and adapted to support said packaged blasting unit and to move said packaged blasting unit in a direction substantially perpendicular to said guiding arms, a first operating means for rotating said first frame means in relation to said boom, a second operating means for moving said second frame means along said guiding arms, and a third operating means adapted to move said supporting means and to bring the opening of said packaged blasting unit into tight contact with said surface.

3,908,315

GRINDING MACHINE SYSTEMS

Robert L. Schaller, Baldwinsville, N.Y., assignor to Sundstrand Syracuse, Inc., Syracuse, N.Y.

Filed Oct. 19, 1973, Ser. No. 407,980
Int. Cl.² B24B *5/22*
U.S. Cl. 51—103 R **8 Claims**



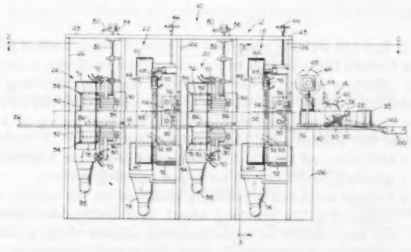
1. A plural station grinding machine with each station having a grinding wheel, said grinding wheels being positioned for simultaneous operation on a workpiece, first and second means associated one with each grinding wheel for driving the associated grinding wheel at a variable rate of speed, means for determining the actual surface speed of each of said grinding wheels, means for setting the same predetermined surface speed for both of said grinding wheels, and means responsive to both said setting means and said determining means for controlling the first and second driving means independently of each other to have both of said grinding wheels operate with the same surface speed to avoid generating torque in a workpiece which is engaged by both of said grinding wheels.

3,908,316

MULTI-STATION SIMULTANEOUS DUAL-SIDE SANDING MACHINE

Richard L. Rettew, Newmanstown, Pa., assignor to Lok-Box, Inc., York, Pa.

Filed Sept. 4, 1974, Ser. No. 502,920
Int. Cl.² B24B *21/00*
U.S. Cl. 51—138 **10 Claims**



1. A sanding machine having a supporting frame structure of interconnected vertical and horizontal frame members to

support units thereof adapted to sand the four peripheral sides of a plurality of head-to-foot abutted rectangular shaped objects during a single pass of said objects through said machine comprising in combination, a laterally disposed compressive infeed conveyor means by which opposite sides of said objects are compressively engaged in abutting head-to-foot relationship one to the other and impelled unidirectionally from the feed end to the delivery end of said machine along an elongated series of guide members having horizontal supporting surfaces extending from the feed to the delivery ends of said machine to provide a path along which said objects are slidably supported in said head-to-foot abutting relationship to each other during movement through said machine, a first sanding unit comprising a pair of opposed endless sanding belts having parallel vertical courses disposed adjacent opposite sides of said guide members and operable simultaneously to sand opposite lateral faces of said objects, horizontal guide means laterally disposed below the lower surfaces of said abutted objects to resist downward deflective movement therof from the plane of said guide members, a second sanding unit comprising another pair of opposed endless sanding belts having vertically spaced parallel horizontal courses respectively above and below the other pair of opposed surfaces of said objects as moved along said guide members, said guide members being interrupted to accommodate said courses of said horizontal belts above and below said objects, perpendicular guide means adjacent one side of said guide members between said horizontal courses of said another pair of belts to permit said objects to resist lateral movement from said guide members in the direction of movement of said courses of said horizontal belts, and supporting frame means supporting all of said conveyor means and guide members in association with said first and second sanding units.

3,908,317

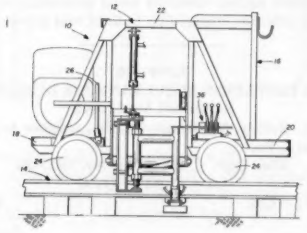
RAIL BASE GRINDING APPARATUS

Lester N. Hambrick, 121 Woodland Dr., Irving, Tex. 75060, and Carl C. Flowers, 2872 Alden Ave., Dallas, Tex. 75211

Continuation of Ser. No. 169,986, Aug. 9, 1971, abandoned. This application June 29, 1973, Ser. No. 376,882

Int. Cl.[2] B24B *24/00*

U.S. Cl. 51—178 **12 Claims**



1. In a rail welding system of the type in which welded joints are formed between rails in a trackway at a track site, a device for effecting in situ removal of weld flashing extending beneath the bottom surfaces of the base portions of the rails in the trackway and thereby facilitating the positioning of a tie under the welded joint which comprises:

a self-powered vehicle for movement along the trackway;

a grinding wheel having an upper grinding surface;

a linkage mechanism pivotally mounted on the vehicle and supporting the grinding wheel, said linkage mechanism for positioning the upper grinding surface of the grinding wheel in a horizontal plane extending parallel to the bottom surfaces of the rails connected by the welded joint and for thereafter moving the grinding wheel with the upper grinding surface thereof remaining in said horizontal plane to engage the upper grinding surface of the grinding wheel with weld flashing of the welded joint extending beneath the plane of the bottom surfaces of the base portions of the rails connected by the welded joint; and

means for rotating the grinding wheel during the movement thereof and thereby removing the flashing of the welded joint which extends beneath the plane of the bottom surfaces of the joint.

3,908,318

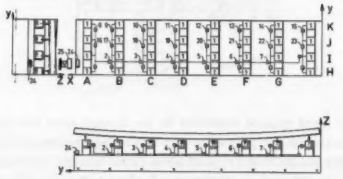
METHOD OF VIBRATION DAMPENING BY SURFACE GRIDING

Sven-Herman Wallin, Djursholm, Sweden, assignor to Ambar Investment Inc., Herrliberg, Switzerland

Filed Mar. 22, 1974, Ser. No. 454,028

Int. Cl.[2] B24B *41/06*

U.S. Cl. 51—240 R **4 Claims**



1. A levelling and vibration damping support system for a slab that is to be ground, said system being characterized by

a. a horizontally disposed table bed,

b. a plurality of upright hydraulic cylinders secured in a pattern on top of said table bed so that the upper portions of said cylinders will support said slab,

c. a closed hydraulic communicating system interconnecting the hydraulic cylinders that are to support the slab,

d. a plurality of magnetically operated valves in said system for controlling the flow of hydraulic fluid to and from each hydraulic cylinder, and

e. means for activating or deactivating each of said magnetically operated valves,

whereby when a slab is placed upon said upper portions of said pattern of hydraulic cylinders, all of said magnetically operated valves can be unlocked at once so as to equalize the pressure of the hydraulic fluid in each of said hydraulic cylinders and after the loading of the slab on said cylinders is accomplished and the grinding is to start, the magnetically operated valves can be locked so that there is no flow of fluid between any of the hydraulic cylinders.

3,908,319

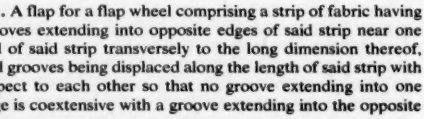
FLAP FOR A FLAP-TYPE FINISHING WHEEL

Gus J. Schaffner, III, Pittsburgh, Pa., assignor to Schaffner Manufacturing Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 259,538, June 5, 1972, Pat. No. 3,890,119. This application Mar. 17, 1975, Ser. No. 558,662

Int. Cl.[2] B24D *11/00, 9/02*

U.S. Cl. 51—394 **3 Claims**



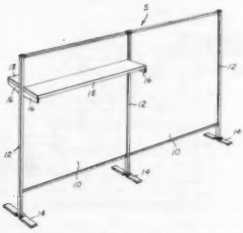
1. A flap for a flap wheel comprising a strip of fabric having grooves extending into opposite edges of said strip near one end of said strip transversely to the long dimension thereof, said grooves being displaced along the length of said strip with respect to each other so that no groove extending into one edge is coextensive with a groove extending into the opposite edge.

3,908,320

MOVABLE WALL PARTITION INCLUDING SHELF OR SIMILAR OBJECT SUPPORTING BRACKETS

Norman E. Hogue, Niles, Mich., assignor to Packard Industries, Inc., Niles, Mich.

Filed Dec. 6, 1974, Ser. No. 530,062
Int. Cl.² E04B 2/82
U.S. Cl. 52—36 4 Claims



1. A wall partition comprising a panel having first and second oppositely spaced side faces and vertical end edges at which said side faces terminate, said panel having at least one vertically aligned opening formed in one of its end edges, a vertical spacer member having opposite sides terminating in marginal edges, said spacer member at one of its sides overlying said panel one end edge, retainer means extending the length of said spacer member and overlying the other side of the spacer member, yieldable biasing means connecting said panel and retainer means for causing said spacer member to be compressed between said retainer means and panel at its one end edge, a shelf or similar object supporting bracket, said bracket including a flange terminating in a generally right angular lip means having a lower edge, said bracket lip means fitted into a said panel opening, said bracket having an assembly position in which said bracket flange generally parallels said one of said panel faces with its lip means fitted between said panel one end edge and retainer means, said bracket being shiftable from its assembly position into a supporting position in which the bracket flange extends outwardly from said one panel face and said lip projects into said panel end edge opening with said bracket being supported by one of said spacer member and panel, said biasing means yieldably permitting separation of said retainer means from said panel as said bracket is shifted from its assembly position into its support position.

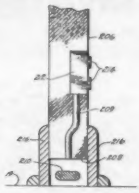
3,908,321

INSTALLATION OF CONDUITS IN PRECAST CONCRETE HOUSING

Elmer Adrian Cox; Wayne Douglas Tiner, and Ritchey Paul Woods, Jr., all of San Antonio, Tex., assignors to H. B. Zachry Co., San Antonio, Tex.

Division of Ser. No. 191,505, Oct. 21, 1971, Pat. No. 3,772,835. This application July 2, 1973, Ser. No. 375,842
Int. Cl. E04b 5/48
U.S. Cl. 52—79 8 Claims

1. A precast concrete building unit comprising the combination of a floor structure having a top surface; at least one upright cast concrete load-bearing exterior wall joined with the floor structure and extending above the top surface of the floor structure; a roof cast integrally with one or more of the exterior walls; an interior wall having an end which is cast integrally with at least one of the exterior walls and a top which is cast integrally with the roof, the interior wall having an undersurface spaced from the upper surface of the floor structure so that the interior wall does not transmit a load to the floor structure; an electrical outlet embedded in the interior wall; and an electrical conduit extending between the undersurface of the interior wall and the upper surface of the



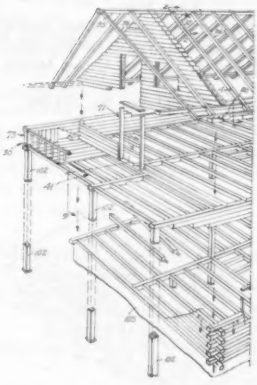
floor structure, the electrical conduit being connected to the embedded electrical outlet.

3,908,322

BUILDING CONSTRUCTION

George E. Shoaf, Box 226, Orwigsburg, Pa. 17961

Filed Nov. 12, 1973, Ser. No. 414,626
Int. Cl.² E04B 1/58
U.S. Cl. 52—90 8 Claims



1. In a building construction, vertically disposed walls, a roof including inclined portions, a lower first floor, at least one other floor above said lower floor, an elevated balcony and rail, said building construction including a plurality of members arranged contiguous to each other, interfitting joints at the junction of certain of said members with said joints consisting of a plurality of openings in certain of said members with each having a cylindrical, tapering portion ending in a uniform cylindrical portion, certain other of said members having reduced diameter cylindrical, tapering portions ending in a uniform cylindrical portion snugly received in said opening.

3,908,323

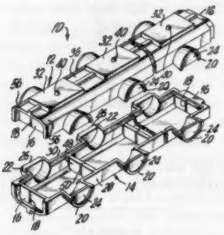
VOID CREATING DEVICE TO BE EMBEDDED IN A CONCRETE STRUCTURE

Robert K. Stout, Hamburgo, Num. 75, 9° Piso, Mexico City 6, Mexico

Filed July 11, 1974, Ser. No. 487,604
Int. Cl.² E04B 5/48
U.S. Cl. 52—99 25 Claims

1. A void creating device to be embedded in a concrete structure to define a labyrinth of passageways therein comprising an elongated hollow member made of a molded frangible material, said member having a first plurality of spaced, opposed projections disposed along the length thereof, and a second set of opposed, spaced projections extending along the

length thereof, with said second set of projections extending generally orthagonal to the first set of spaced, opposed projections, and wherein the ends of said hollow member are closed



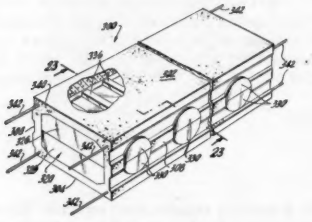
by frangible baffles, and are of the tongue and groove configuration to enable interfitting of two such void creating devices along the longitudinal axes thereof.

3,908,324

CONCRETE STRUCTURE INCLUDING MODULAR CONCRETE BEAM AND METHOD OF MAKING SAME

Robert K. Stout, Hamburgo 75 Pent House, Mexico 6, D.F., Mexico

Filed Sept. 20, 1973, Ser. No. 399,087
Int. Cl.² E04C *2/10, 3/29*
U.S. Cl. 52—100 **5 Claims**



1. A composite modular concrete beam having a labyrinth of passageways therein comprising an elongated structure having a cross-section defining two opposed sides, a top surface, and a bottom surface, said composite structure being formed by:

1. an internal elongated hollow member made of insulation material and corresponding in length to the length of the modular concrete beam, said hollow member having a cross-section including a top surface, a bottom surface, and two opposed sides, with the cross-section of the hollow member being of smaller dimensions than the cross-section of said composite concrete beam, said hollow member being made of frangible material and including a plurality of unitary, spaced projections extending from the opposite sides thereof, with the opposite ends of said hollow member being closed, and;

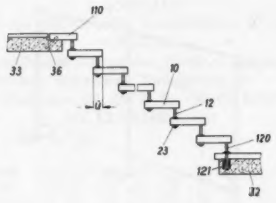
2. a concrete structure extending about and in intimate contact with said hollow member along the top, bottom and opposite sides thereof, said concrete structure being of a thickness along the opposite sides of the hollow member such that the unitary projections of the internal hollow member are exposed, thereby enabling access through the unitary projections and the opposite ends of the frangible hollow member to the labyrinth of passageways therein.

3,908,325

FLIGHT OF STEPS AND A STAIRCASE COMPRISING A FLIGHT OF STEPS

Hans Kenngott, Heilbronn-Bockingen, Germany, assignor to Kenngott KG, Germany

Filed Oct. 11, 1973, Ser. No. 405,417
Claims priority, application Germany, Oct. 17, 1972, 7238093
Int. Cl.² E04F *11/14*
U.S. Cl. 52—188 **11 Claims**



1. A staircase leading from a bottom plane structure, such as a floor or a landing in a building structure, to a top plane structure such as a landing or a roof in said building structure, comprising;

a wall,

a plurality of steps upwardly spaced from one another, forwardly following one another, and laterally spaced a short distance from said wall, every step but the uppermost one having a rear edge portion overlapped by a front edge portion of the next upper step and the uppermost step having a rear edge portion overlapping a front edge portion of a top plane structure;

means for supporting the steps by one another, comprising sets of spindles rising from the rear edge portion of one step to the front edge portion of the next upper step, each set comprising two spindles, to-wit, a spindle adjacent the wall and another spindle remote from the wall;

means for holding the steps a short distance from the wall and comprising a number of rigid bars said number being no greater than the number of steps in said plurality of steps and said bars being regularly distributed relative to the plurality of steps, each bar having a generally rectangular cross-sectional shape, having a cross section smaller than and generally parallel to that of a step, and having a portion secured to an underside of one of the steps, adjacent the wall, in the respective rear edge portion, with aid of one of said spindles; a portion of each bar projecting from the step toward and into the wall, the wall having recesses, each receiving one of the projecting portions of said bars; and

means in each recess for holding the projecting portion of the corresponding rigid bar, rigidly anchored to the wall bar.

3,908,326

BRICK PANEL CONSTRUCTION

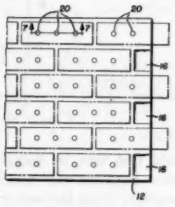
Gerald T. Francis, 25257 W. Eight Mile Rd., Detroit, Mich. 48240

Filed Dec. 20, 1973, Ser. No. 426,508
Int. Cl.² E04F *13/08*
U.S. Cl. 52—384 **1 Claim**

1. A brick panel of the type characterized by a relatively thin, generally planar board having numerous bricks arranged in a conventional pattern of parallel courses, said bricks being bonded to one face of the board by an adhesive layer, and wherein a portion of the face adjacent to at least one of the board edges that extends perpendicular to the brick courses has unbricked portions which alternate along said edge with bricks which partially project beyond said edge, said unbricked portions being adapted to receive in overlapping and interlocking fashion portions of bricks bonded to and project-

ing partially beyond the edge of an adjacent abutting but non-overlapping board, the improvement of:

said unbricked portions being slightly recessed below the plane of the board face which will be bricked, whereby, when the brick panel is subsequentially installed on a supporting structure, said recessed unbricked portions receive and thereby permit the panel board to be readily slid under the projecting bricks of the adjacent already installed panel;



a plurality of depressions in the board face into which adhesive extends so as to form an improved interlock to resist shearing of the brick from the board, said adhesive layer being formed by depositing mounds of adhesive over each of the depressions and applying the bricks to the panel, whereby the adhesive is applied as mounds in order to avoid filling the recesses with adhesive.

3,908,327

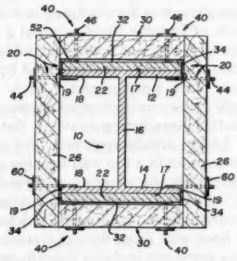
INSULATED STRUCTURAL MEMBER

Paul S. Quigg, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Oct. 2, 1973, Ser. No. 402,880

Int. Cl. E04c *3/30*

U.S. Cl. 52—727 **13 Claims**



1. A fire-resistant structural assembly, comprising a structural member having projecting edges and an exposed surface between said edges, a first layer of insulative material disposed over at least a portion of said exposed surface, a second layer of insulative material disposed over at least a portion of an exposed surface of said first layer, and attachment means for independently attaching said first and second layers of insulative material to said structural member comprising an integral clip including a clamping portion and an impaling portion, said first layer being clamped to said structural member by said clamping portion, and said second layer being attached to said structural member by said impaling portion.

3,908,328

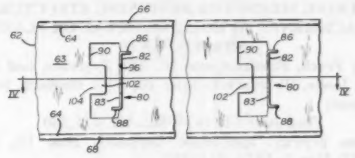
RUNNER AND METHOD OF MAKING SAME

Nels Nelsson, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Sept. 7, 1973, Ser. No. 395,325

Int. Cl.² E04C *3/30;* **B23P** *17/00*

U.S. Cl. 52—735 **13 Claims**



1. An elongate runner for receiving and retaining an edge of at least one wall panel disposed between a floor and a ceiling, said wall panel having a front surface and a back surface and a panel thickness defined by the distance between the front and back surfaces, and said runner comprising

an elongate web,

at least one side flange depending angularly from said elongate web along at least a portion of one side margin thereof, and

at least one support member depending angularly from said elongate web, said member being disposed generally transverse of said elongate web, the side margin of said support member nearest said one side flange being spaced therefrom by a distance substantially equal to the thickness of the wall panel to be retained between said side flange and said support member, whereby said support member provides resistance to transverse forces imposed upon said panel.

3,908,329

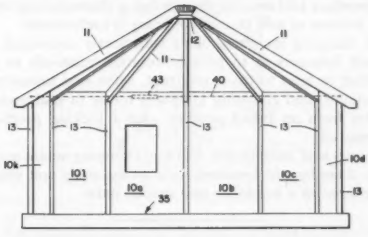
POLYGONAL BUILDING CONSTRUCTION

Robert C. Walters, Tahoe City, Calif., assignor to Rondo Homes, Inc., Reno, Nev.

Filed Dec. 7, 1973, Ser. No. 422,852

Int. Cl.² E04G *21/14;* **E04B** *1/35*

U.S. Cl. 52—747 **3 Claims**



1. A method of erecting a building comprising:

a. forming a perimeter wall by putting up a plurality of rectangular wall sections in end-to-end relation but spaced-apart relation, said wall sections being secured against movement of their lower ends and being temporarily supported in roughly plumbed position,

b. supporting a compression ring approximately centrally of and above said perimeter wall,

c. securing the upper end of a rafter to said compression ring,

d. temporarily supporting the lower end of said rafter between the upper ends of a pair of adjacent wall sections,

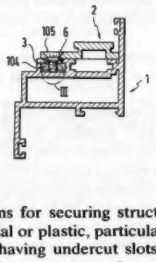
e. repeating steps (c) and (d) so that there is a rafter between each pair of adjacent wall sections,

f. passing a perimeter cable through the upper end of each wall section and through the lower end of each rafter,
g. applying a tension force to the ends of said cable,
h. adjusting the amount of tension force to plumb the rectangular wall sections.

3,908,330
SECURING MEANS FOR FASTENING STRUCTURAL ATTACHMENTS TO HOLLOW METAL OR PLASTIC SHAPED PARTS

Werner Frach, Friedenstrasse 16, 858 Bayreuth, and Bernhard Janke, Hirtenackerstrasse 10, 8581 Bindlach, both of Germany

Filed June 11, 1974, Ser. No. 478,280
Claims priority, application Germany, June 18, 1973, 2330897; May 3, 1974, 2421587
Int. Cl.² F16D *39/00*
U.S. Cl. 52—758 F **9 Claims**



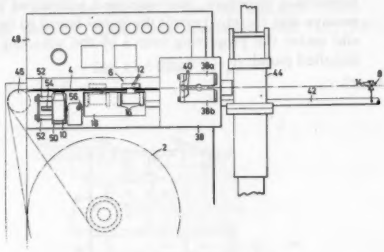
1. Securing means for securing structural attachments to shaped parts of metal or plastic, particularly shaped frames of doors or windows having undercut slots providing undercut walls spaced apart by an aperture slot, comprising:
clamping members whose length is greater than their width, inserted into said slots and engaging under surfaces of said undercut walls, said clamping members being narrower in width than said aperture slot and shorter in length than the undercut portion of said slots, and
fasteners for connecting said attachments and said clamping members, said fasteners being rotatably anchored to said attachments, said fasteners being tensioning screws screwed into tapped through openings of said clamping members said securing means being characterized in that a portion of said through opening is unthreaded,
said clamping members being sufficiently connected with said fasteners as to prevent rotation relatively to each other at least to the extent that, when said fasteners are rotated, said clamping members rotate in said undercut slot from an initial position and a locking position is ensured,
whereby said attachments and said clamping means secured to them by said fasteners form an assembly unit which is secured as a whole on said shaped parts.

3,908,331
WEB REGISTRATION METHOD AND APPARATUS

Henry Donnet, Falaise, France, assignor to Ste. d'Application Plastique Mecanique et Electronique Plastimecanique, Courbevoie, France

Filed Nov. 6, 1973, Ser. No. 413,191
Claims priority, application Germany, Nov. 9, 1972, 2254715
Int. Cl.² B65B *41/18, 47/00*
U.S. Cl. 53—3 **8 Claims**

1. In a packaging process comprising intermittently feeding a web of thermoplastic film having spaced, repeat indicia formed thereon, whereby said film web is formed in a container forming stage, the container is filled in a container filling stage and the container is closed in a container closing stage, an improved method of compensating for predetermined deviations of said indicia, said method comprising the steps of:
a. detecting said predetermined deviation with probe means;

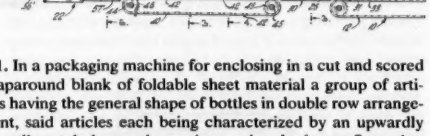


b. clamping said film web on either side of a container forming station between two horizontally spaced apart clamping members when the web is stopped; and
c. longitudinally displacing one of said clamping members with respect to the other, thereby stretching the film web by a predetermined amount to compensate for the predetermined deviation detected by said probe means.

3,908,332
PACKAGING MACHINE

William W. Ebbinghaus, River Vale, and John H. Myers, Bergenfield, both of N.J., assignors to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Nov. 8, 1973, Ser. No. 413,796
Int. Cl.² B65B *21/04, 21/24*
U.S. Cl. 53—48 **7 Claims**



1. In a packaging machine for enclosing in a cut and scored wraparound blank of foldable sheet material a group of articles having the general shape of bottles in double row arrangement, said articles each being characterized by an upwardly extending tubular neck portion and a body configuration having a generally oval cross section with transversely curved vertical edge portions connecting relatively flat side portions and said blank having article neck receiving apertures in a double row arrangement in a top wall forming panel with the apertures in transversely aligned pairs, an infeed conveyor for advancing two lines of the articles to an associated apparatus for uniformly positioning and holding the articles in uniformly spaced, double lines with pairs thereof transversely aligned, which positioning apparatus includes laterally spaced, parallel auger members having co-operating spiral grooves in which the articles are received, and which constitute means formed to orient the articles so that the long axis thereof extends parallel to the axes of the auger members and the flat side portions thereof face in a direction transversely of the path of advance thereof and to space the articles uniformly and hold them with the neck portions in double row arrangement corresponding to the aperture arrangement of the apertures in the blank, and an overhead blank feeding mechanism, for depositing blanks onto successive groups of a predetermined number of articles, while the articles are advanced by said auger members, and means for driving the auger members and the blank feeding mechanism in timed relation for deposit of the blanks on the successive groups of articles while the articles are held

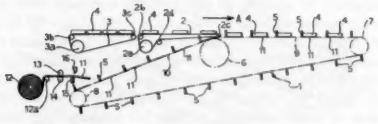
by said auger members in oriented and aligned position so that said neck portions are received in the apertures in said blanks.

3,908,333

DEVICE FOR REGISTERING ARTICLES AND PACKAGE ELEMENTS THEREFOR DURING FEED TO A PACKAGING MACHINE

Mario Cavanna, Prato Sesia (Novara), Italy

Filed Oct. 31, 1973, Ser. No. 411,570
Claims priority, application Italy, Nov. 2, 1972, 31247/72
Int. Cl.² B65B *41/18*
U.S. Cl. 53—51 **4 Claims**



1. A device for bringing articles and respective individual package elements therefor into registration with each other while feeding the articles and package elements to a packaging machine comprising positive endless main conveyor means including a first stretch for receiving and conveying said package elements and a second stretch for receiving said articles on said package elements and conveying said articles and the package elements to said packaging machine, spaced apart pusher elements secured to said main conveyor means for feeding package elements along said first and second stretches, article feed conveyor means disposed above said first stretch for feeding articles onto package elements carried by said main conveyor means, said article feed conveyor means being aligned with both said first and second stretches in a vertical plane, said article feed conveyor means having an end portion terminating close to said main conveyor means at a point substantially between said first and second stretches, said article feed conveyor means having passage means for said pusher elements to pass at least partially above said end portion, said pusher elements travelling in a path in which at least their top parts pass above said end portion whereby said pusher elements will engage and feed said articles and said package elements in registration with each other on said second stretch.

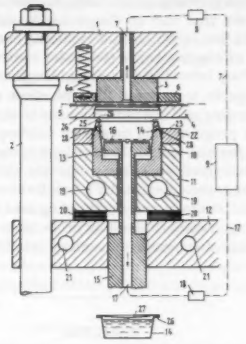
3,908,334

APPARATUS FOR HERMETIC CLOSURE OF FILLED CONTAINERS

Hans Rychiger, Bern, Switzerland, assignor to Alupak AG, Bern, Switzerland

Filed Sept. 18, 1973, Ser. No. 398,544
Claims priority, application Switzerland, Sept. 20, 1972, 13717/72
Int. Cl.² B65B *31/02*
U.S. Cl. 53—86 **4 Claims**

1. An apparatus for sealing an opening of a filled sheet-material container in a manner to prevent spurting of the container contents during the later breaking of the seal, comprising a lower punching tool for punching a closure from a sheet of closure material; an upwardly open cupped receiver for accommodating a filled sheet-material container having an upwardly facing opening; cooperating juxtaposed sealing surfaces on said lower punching tool and said receiver which engage one another when said receiver is moved upwardly against said lower punching tool so that the latter forms with said receiver an enclosed chamber in which the container is located; pressure-reducing means for producing in said chamber and said container a sub-atmospheric pressure; an upper punching tool above and cooperating with said lower punching tool to punch said closure when said chamber and container are at said sub-atmospheric pressure; and sealing means



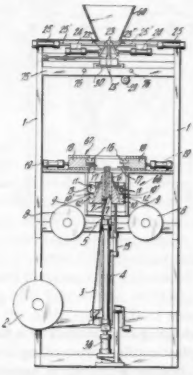
for sealing the punched closure to said container over said opening thereof.

3,908,335

APPARATUS FOR PACKING PLASTIC BAGS WITH CONTENTS OF CONSTANT AND PRESELECTED WEIGHT AND OPERATING IN A CONTINUOUS AND AUTOMATIC CYCLE

Roberto Giannelli, via Aretina 220, Florence, Italy

Filed Apr. 29, 1974, Ser. No. 465,355
Claims priority, application Italy, May 3, 1973, 9442/73
Int. Cl.² B65B *1/02, 9/12, 41/14*
U.S. Cl. 53—138 A **9 Claims**



1. Apparatus for packing bags with contents of constant and preselected weight by forming, filling and sealing the bags automatically and continuously in a repetitive cycle, said apparatus comprising, in combination, drawing means operable to take, from a supply thereof, a length of tubular envelope equal to the height of the bag and to orient such length vertically; first gripping means operable to receive the length from said drawing means and to grip the upper end of such length to suspend the length; first sealing means operable to seal the bottom end of the suspended length to form an open top bag; second gripping means operable to grip and lift the bottom of the formed bag; spreading means, including said first gripping means, operable to spread open the upper end of the bag for filling of the contents into the bag; second sealing means operable to seal the upper end of the filled bag; means for storing a continuous tubular envelope; said drawing means including means for holding spread and partially open the free

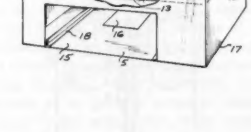
end of the envelope, and means for gripping and extending vertically a portion of the envelope equal to the height of the bag; said first gripping means being further operable to open and close the free end of the vertically extended envelope portion; said first sealing means including cutting means operable to cut off the bag below the sealed bottom end thereof to sever the bag from the remaining length of the envelope; means operable to control the operation of said drawing, gripping, sealing and spreading means in accordance with a preselected program; said means for holding spread and partially open the free end of the envelope comprising a substantially parallelepiped block freely movable within the envelope; said drawing means comprising a box form outer clamp open at its top and laterally and surrounding said block; said outer clamp having inwardly extending projections maintaining said block against downward movement relative to said outer clamp.

3,908,336

DEVICE FOR PACKAGING AND HEAT SEALING OF WASTE

Per Anders Goran Forslund, Nora, Sweden, assignor to Pactosan AB, Nora, Sweden

Filed Dec. 28, 1973, Ser. No. 429,155
Claims priority, application Sweden, Jan. 3, 1973, 7300052
Int. Cl.[2] B65B *9/10, 9/12, 9/16*
U.S. Cl. 53—183 **7 Claims**



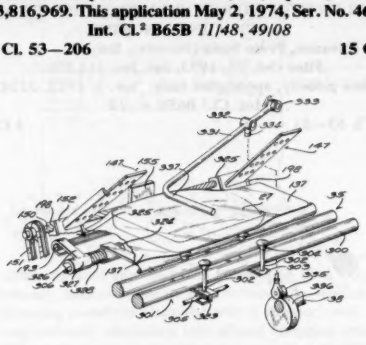
1. Device for packaging of materials in a tube, particularly human waste in a plastic tube, comprising in combination: a vertically disposed hollow mandrel, a supply of packaging tube stored upon the exterior of and fed upwardly across the upper mouth of said mandrel and downwardly through the interior thereof, a tube feeding means positioned beneath said mandrel, said tube-feeding means being provided with two parallel geared-together shafts straddling said tube, a motor for driving said shafts, a pair of reciprocatable transversal heat-sealing jaws straddling said tube and coacting with said shafts, a controllably activatable control unit for causing said motor to rotate for an operating cycle, mean responsive to the rotation of said motor for opening and then partially closing said jaws, means responsive to the rotation of said motor for activating said tube-feeding means to feed a predetermined length of said tube while said jaws are open, an operating member that upon operation activates said control unit, means responsive to said operating member and operable after completion of said operating cycle for said tube-feeding means for pressing said jaws together, and means operable when said jaws are together for transmitting an energy impulse to said jaws for forming a transverse seal across said tube.

3,908,337

FILM TUCKING APPARATUS

Thomas C. Zimmerman, Franksville, and Charles E. Michels, Racine, both of Wis., assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation-in-part of Ser. No. 290,664, Sept. 25, 1972, Pat. No. 3,816,969. This application May 2, 1974, Ser. No. 466,112
Int. Cl.[2] B65B *11/48, 49/08*
U.S. Cl. 53—206 **15 Claims**



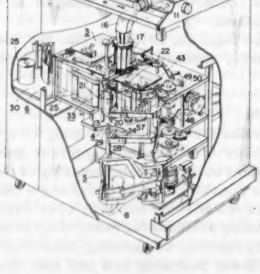
1. Film tucking apparatus comprising a platform for a partially wrapped article having film wings extending beyond both sides of the article and overlying the platform, paired tucking arms, one at each side of the article and overlying said film wings, said film wings being thus disposed between said arms and said platform, article elevator means, means for raising the elevator means with respect to the platform to lift the article above the platform and open a narrow space between the platform and article into which the film wings may be swept and means for advancing said tucking arms toward each other into said space to wipe the film wings along the platform and the article and sweep the film wings beneath the article.

3,908,338

COIN WRAPPING APPARATUS

Masatoshi Ushio, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed Jan. 15, 1974, Ser. No. 433,492
Claims priority, application Japan, Jan. 17, 1973, 48-8026
Int. Cl.[2] B65B *11/04*
U.S. Cl. 53—212 **4 Claims**



1. In a coin wrapping apparatus having a plurality of wrapping rolls including at least one movable roll, guide means for guiding a stack of coins into a wrapping space between said wrapping rolls and a coin stacking portion for stacking a predetermined number of coins, fold crimping means positioned adjacent said wrapping rolls, wrapping paper supply

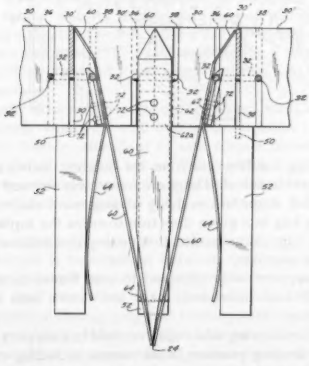
means operatively located for supplying wrapping paper to said wrapping rolls, and driving means operatively coupled for driving at least one of the wrapping rolls, a coin stack being rotated by said wrapping rolls, wrapped with a piece of paper and the lateral edges of the wrapping paper being fold crimped by said fold crimping means against upper most and lowermost coins in said coin stack, the improvement which comprises: rotational speed setting means coupled with said driving means and adapted for setting the speed of driving rotation transmitted from said driving means to at least one driving roll of said wrapping rolls to a predetermined speed in accordance with the diameter of coins to be wrapped, thereby to rotate said driving roll at a predetermined speed in accordance with the diameter of the coins during wrapping operation; rotational speed selecting means coupled with said speed setting means and operated in response to change of diameter of coins to be wrapped so as to select a predetermined speed to be set in accordance with the diameter of coins, thereby to set said rotational speed setting means; roll-position adjusting means for positioning at least one of said wrapping rolls at a position accommodated to the diameter of coins to be wrapped and adapted for guiding the coin stack in order to adjust the wrapping space surrounded by the wrapping rolls so as to be suitable for guiding the coin stack; position selecting means operated in response to change of diameter of coins to be wrapped and adapted for selecting and setting said roll position adjusting means to the state accommodated to the coins to be wrapped; and control means operatively coupled to the respective parts of the apparatus for causing repetition of the wrapping cycle in a predetermined time cycle including various operations which are respectively carried out in mutual relationship in accordance with a previously determined sequence, and said various operations comprising the guiding operation of said coin guiding means for guiding the coin stack to the movement of the movable roll toward and away from the peripheral surface of the coin stack for accommodating said wrapping space to guidance of the coin stack in accordance with diameter of the coins, the wrapping paper supply operation, and the crimping operation for the wrapped paper.

3,908,339

PACKER GRID AND FINGERS ASSEMBLY

Francis M. Kennedy, Lynchburg, and David Phillips, Forest, both of Va., assignors to Simplimatic Engineering Co., Lynchburg, Va.

Filed Jan. 9, 1974, Ser. No. 431,948
Int. Cl.[2] B65B *39/02*
U.S. Cl. 53—248 **21 Claims**



5. In a packer grid and fingers assembly comprising

A. a grid of generally horizontal orientation defining at least one grid cubicle of polygonal configuration having an article-passage therethrough; and

B. a plurality of replaceable finger subassemblies for each said grid cubicle disposed about said passage thereof and having a generally vertical orientation, each of said finger subassemblies comprising

i. an elongated substantially rigid finger, said finger having a front surface facing said passage axis and a rear surface facing said grid cubicle,

ii. means for removably and pivotally securing said finger subassembly to said grid cubicle external to said passage, and

iii. means for urging an end of said finger spaced from said grid toward the axis of said passage;

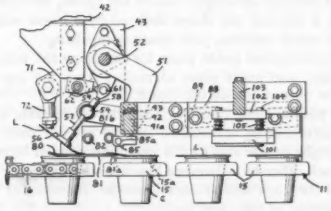
the improvement wherein said finger subassemblies are separately mounted in different corners of said grid cubicle with the rear surface of said fingers facing said corners, and said urging means comprises a resilient composition disposed between the rear surface of said finger and said grid urging the bottom end of said finger towards said passage axis.

3,908,340

APPARATUS FOR FEEDING AND APPLYING INDIVIDUAL LIDS TO CONTAINERS

Stefan Erhardt, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.

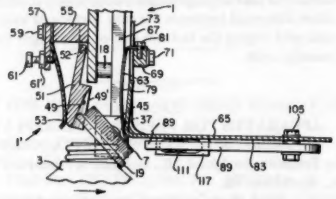
Filed Mar. 25, 1974, Ser. No. 454,091
Int. Cl.[2] B65B *7/28, 51/14, 51/16*
U.S. Cl. 53—307 **16 Claims**



1. An apparatus for applying individual lids to the upper rims in preformed containers comprising, a support frame, conveyor means on said support frame for advancing preformed containers in continuous fashion in a forward direction along a path past a lid applying station, a lid magazine for storing a stack of inverted lids adjacent said lid applying station, lid feed means for removing individual lids from the stack and for applying the lids to the containers while they are advancing along the path, said lid feed means including lever means mounted to said support frame for swinging movement about a first horizontal axis spaced in said forward direction from the lid magazine, a gripper head mounted on said lever means for swinging movement relative thereto about a second horizontal axis spaced from said first axis, a vacuum cup mounted on said head at a location laterally offset from said second axis, means operated in timed relation with the conveyor means for cyclically swinging said lever means from a raised position in which said second axis is below said lid magazine and laterally offset generally horizontally from said first axis downwardly and forwardly to a lowered position in which said second axis is generally vertically below said first axis and back to said raised position, and means including an arm connected to said head and a link pivotally connected at one end to said arm for swinging said head relative to said lever means about said second axis as said lever means moves between said raised and lowered positions, said lever means, arm and link being constructed and arranged to orient the vacuum cup in a upwardly facing attitude and move the vacuum cup in a direction generally axially of the cup as the lever means moves into and out of its raised position and to orient the vacuum cup in a downwardly facing attitude and move the

vacuum cup in said forward direction at a level adjacent the tops of the container as the lever means appraoches said lowered position, and means for controlling application of vacuum to the vacuum cup in timed relation with its movement.

3,908,341
CAP FEEDING DEVICE
Vincent N. Conti, West Hempstead, N.Y., assignor to Dairy Cap Corporation, Jamaica, N.Y.
Filed Feb. 7, 1974, Ser. No. 440,312
Int. Cl.[2] B67B *3/20, 3/08*
U.S. Cl. 53—314 **19 Claims**



1. A cap feeding device for successively delivering caps from a supply, downwardly through a delivery chute and onto bottles passing the output end of the chute, each of said caps having a circular hat shape defined by a lower enlarged rim and an upper portion, said chute comprising:

a. an elongated guide plate for engaging the bottom of the caps, said guide plate extending from the cap supply to the output end of the chute;

b. a pair of guide rails overlying the guide plate and spaced therefrom by a distance slightly greater than twice the height of the rim of the caps and spaced laterally from each other by a distance less than the diameter of the rim of the caps and greater than the diameter of the upper portion of the caps; and

c. a cap pre-tightening mechanism for initiating the threading of the caps onto successive bottles passing away from the output end of the chute, said pre-tightening mechanism being horizontally disposed and positioned on the downstream side of the output end of the chute and including a first rail member for drivingly engaging one side of the caps and a smooth rail member surfaced for slidably engaging the diametrically opposite sides of the caps, said rail members extending along the path of movement of the bottles away from the chute for engaging opposite sides of the caps and rotating them onto the associated bottle as the bottles move away from the output end of the chute, wherein:

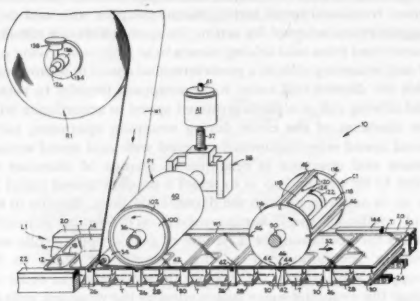
i. one of said rail members is pivotally mounted, along the path of movement of the bottles at its upstream end;

ii. the other of said rail members is pivotally mounted, along the path of movement of the bottles at its downstream end; and

iii. spring means is provided for urging the other ends of the rail members toward the path of movement of the caps on the bottles.

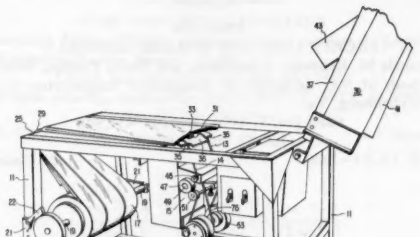
3,908,342
HEAT SEALING MACHINE
Glen F. Raque, Louisville, Ky., assignor to FMC Corporation, San Jose, Calif.
Filed Oct. 26, 1973, Ser. No. 409,999
Int. Cl.[2] B65B *7/28*
U.S. Cl. 53—329 **4 Claims**

1. Apparatus for applying covers to peripherally flanged trays, said apparatus being of the type which comprises conveyor means for advancing a series of spaced trays, means for applying and sealing a cover web to the tray flanges, and knife means for severing the cover web between adjacent trays; the improvement wherein said conveyor means comprises fixed, laterally spaced longitudinal rails for slidably supporting the side flanges of each tray, an endless moving conveyor having



a reach that passes between said rails, and transverse flights on said conveyor, the upper surfaces of said flights being flush with the upper surfaces of said rails along said conveyor reach for supporting the end flanges of adjacent trays, each of said flights being formed to provide a full length recess for receiving a blade of said web severing knife means.

3,908,343
IMBRICATED BAG LOADING MACHINE
Walter M. Farrelly, Wilmington, Del., assignor to Vac-Pac Manufacturing Co., Baltimore, Md.
Filed Oct. 7, 1974, Ser. No. 512,854
Int. Cl.[2] B65B *43/36*
U.S. Cl. 53—385 **8 Claims**



1. A bag loading machine for loading imbricated bags wherein said imbricated bags are removably secured to at least two parallel strips in overlying arrangement such that each preceding bag in a given direction overlies the top end of the following bag, said machine comprising in combination

a frame member,

a bag support table attached to said frame member over which said imbricated bags are drawn into a loading position,

means for drawing said bags over said bag support table into said loading position, said means including means for separately drawing each of said strips over said table, said strip drawing means being capable of drawing one strip independently of the other to thereby permit the adjustment of the orientation of said bags, and

means for opening said bags to permit loading thereof.

3,908,344

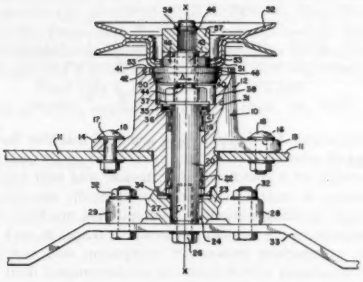
SELF ACTUATING MECHANISM FOR BRAKING A DRIVEN MEMBER UPON DISCONTINUATION OF DRIVE THERETO

James W. Zurek, Lombard, and David A. Fulghum, La Grange, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 296,462, Oct. 10, 1972, Continuation-in-art of Ser. No. 133,641, April 13, 1971. This application Jan. 22, 1974, Ser. No. 435,544

Int. Cl.[2] A01D *69/10*

U.S. Cl. 56—11.3 9 Claims



1. For an implement having a cutter, a drive brake mechanism for driving and braking said cutter, automatically shiftable between drive and brake conditions in response to the direction from which the driving torque is delivered thereto comprising:

support means;

a braking member having a first braking surface thereon slidably non-rotatably mounted in said support means;

spring means interposed between said braking member and said support means, said spring means biasing against axial movement of said brake member toward said support means;

torque transfer means journalled on said support means;

torque transmitting means coupled by coupling means to said torque transfer means, said torque transfer having means rotatably drivable from a source of driving torque, said torque transmitting means including a second braking surface disposed for engagement with said first braking surface;

a normally driven energy-storing structure such as a cutter positively connected with said torque transfer means and driven thereby attendant to said torque transfer means being driven by said torque transmitting means and in driving relation to said torque transfer means upon termination of drive thereto from said torque transmitting means;

shifting means responsive to the direction from which driving torque is transmitted between said torque transfer means and said torque transmitting means, operative to effect axial movement of said torque transmitting means to a position disengaging said braking surfaces and establishing a driving relation with said torque transfer means upon said torque transmitting means being driven by a source of driving torque and operative to effect axial movement of said second braking surface of said torque transmitting means into engagement with said first braking surface upon said torque transfer means being driven by said energy storing structure.

3,908,345

HEIGHT CONTROL FOR IMPLEMENT SUPPORT ON AN AGRICULTURAL MACHINE

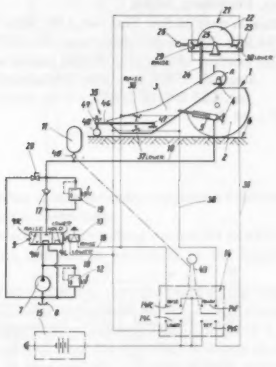
Helmut Oni, Gottmadingen, and Dieter Grabenhorst, Duimen, both of Germany, assignors to Maschinenfabrik Fahr Aktiengesellschaft, Gottmadingen, Germany

Filed Dec. 3, 1973, Ser. No. 421,494

Claims priority, application Germany, Dec. 15, 1972, 2261558

Int. Cl.[2] A01D *67/00*

U.S. Cl. 56—208 9 Claims



1. An agricultural machine comprising:

a vehicle displaceable along the ground and having a frame;

an implement support pivotally mounted on said frame;

a hydraulic ram connected between said support and said frame;

sources of relatively high hydraulic pressure and of relatively low hydraulic pressure connectable to said ram;

valve means between said sources and said ram for pressurizing said ram thereby lifting said support and for depressurizing said ram thereby lowering said support;

first sensor means connectable to said valve means for operating same to maintain said support in a predetermined position relative to said frame;

second sensor means connectable to said valve means for operating same to maintain said support in a predetermined position relative to the ground;

control means connected to said valve means and to said first and second sensor means and having a single control element displaceable between

a set position connecting said first sensor means to said valve means,

a follow position connecting said second sensor means to said valve means,

a raise position operating said valve means to pressurize said ram, and

a lower position operating said valve means to depressurize said ram; and

means for retaining said control element releasably in two of said positions and enabling free displacement of said element into and out of the other positions, said valve means having three positions: a lift position in which said ram is connected to said source of high pressure, a drop position in which said ram is connected to said source of low pressure, and a stop position in which said ram is disconnected from both of said sources, said control element having a fifth hold position corresponding to said stop position of said valve means, said control element being a lever having an end displaceable between a central position corresponding to said hold position and a plurality of other positions sur-

rounding said central position and corresponding to the other positions of said control element, said means for retaining said control element releasably and lockingly securing same in only said hold, set, and follow positions, said element being nonlockingly received in said raise and lower positions.

3,908,346

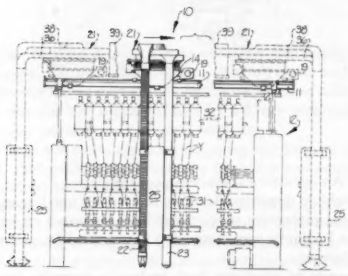
TRAVELING TEXTILE MACHINE TENDING UNIT

Charles D. Lee, Jr., Charlotte, N.C., assignor to Parks-Cramer Company, Fitchburg, Mass.

Continuation-in-part of Ser. No. 141,338, May 7, 1971, Pat. No. 3,754,992. This application Aug. 20, 1973, Ser. No. 390,083The portion of the term of this patent subsequent to Aug. 28, 1990, has been disclaimed.

Int. Cl.[2] D01H *11/00, 13/00, 9/10*

U.S. Cl. 57—34 R 13 Claims



6. A traveling tending apparatus for moving along a track extending longitudinally of and above an elongate textile machine such as a spinning frame and comprising:

carriage means mounted on the track for movement back and forth therealong between opposite end portions of the machine,

tending means supported from said carriage means for alternately tending first one side and then the other side of the machine, said tending means including housing means mounted on said carriage means for rotation about a vertical axis relative to said carriage means, the track and the machine, tube means depending from the housing to a position in an aisle space to one side of the machine, and yarn piecing apparatus mounted from said tube means for passing adjacent yarn forming locations along the sides of the machine,

means operatively connected with said housing means and said tube means for inducing cleaning flows of air therethrough for tending the sides of the machine by pneumatically cleaning the machine, and

control means operatively connected with said carriage means and said tending means for rotating said housing means about said vertical axis when said carriage means approaches an end portion of the machine from one direction and for swinging said tube means and said yarn piecing apparatus around the end of the machine to a position in an aisle space to the other side of the machine and for initiating movement of said carriage means in the other direction.

3,908,347

PROCESS AND APPARATUS FOR THE CONTROL OF SPINNING MACHINES

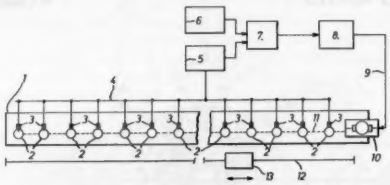
Louis Vignon, Geneva, Switzerland, assignor to Heberlein Hispano SA, Vernier-Geneva, Switzerland

Filed Feb. 20, 1974, Ser. No. 444,162

Claims priority, application Switzerland, Feb. 20, 1973, 2388/73

Int. Cl.[2] D01H *13/16, 13/32*

U.S. Cl. 57—34 R 14 Claims



2. Apparatus for controlling a spinning machine having a number of spinning stations, the spindles of which are rotated by a means of a spindle driving device, and said apparatus comprising at least one sensor for cyclically surveying the individual spinning stations in said spinning machine, means for determining the number of thread breakages in each cyclic survey, comparison means for comparing said number of thread breakages with at least one predetermined limit value, and a signal device controlled by the said means for adjusting said spindle driving device for reducing the spindle speed upon increase of the number of thread breakages and for increasing the spindle upon reduction of the number of thread breakages.

3,908,348

BOBBIN TUBE LOADING APPARATUS

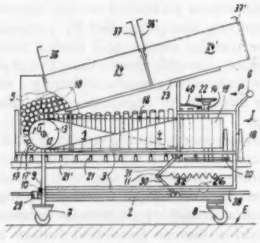
Werner Hirschle; Hans Rutz, and Arthur Würmli, all of Winterthur, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed June 18, 1974, Ser. No. 480,576

Claims priority, application Switzerland, June 22, 1973, 9160/73

Int. Cl. D01h *9/10*

U.S. Cl. 57—53 18 Claims



1. A bobbin tube loading apparatus comprising

a movable carriage;

a chute on said carriage for receiving a supply of bobbin tubes;

tube transfer means mounted on said carriage for moving tubes from said chute to a transfer position, said means including a horizontally disposed drum disposed under said chute, a vertically disposed drum disposed adjacent said transfer position, and an endless transporting chain guided about said drums for taking up the tubes in a horizontal position from said chute and for transporting the tubes into a vertical position at said transfer position,

said chain including a plurality of links each having a recess for receiving a tube;

holding means for preventing the tubes from sliding down from said recesses during movement to said transfer position and for releasing the tubes from said recesses at said transfer position;

drive mechanism for rotating said drums to drive said chain; and

means for synchronizing operation of said drive mechanism with movement of said carriage along a predetermined path alongside a row of take-up pins on one of a ring spinning machine and a ring twisting machine.

3,908,349

FIBER GUIDING PLATE FOR A ROTARY SPINNING CHAMBER OF AN OPEN END SPINNING MACHINE

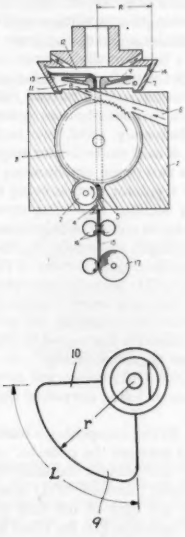
Tooru Urifu, Itami, and Tsutomu Miyazaki, Kariya, both of Japan, assignors to Kaiwa Boseki Kabushiki Kaisha, Osaka and Kabushiki Kaisha Toyoda, Kariya, both of, Japan

Filed July 8, 1974, Ser. No. 486,456

Claims priority, application Japan, Sept. 19, 1973, 48-105766

Int. Cl. D01h *1/12*

U.S. Cl. 57—58.89 **6 Claims**



1. A fiber guiding plate for dividing interior of a rotary spinning chamber of an open end spinning machine having in addition to said rotary spinning chamber a fiber introducing channel directed toward and opening into said spinning chamber, into a fiber feeding part adjacent to an outlet opening of said fiber introducing channel and a yarn withdrawing part on the opposite side of the fiber guiding plate, characterized in that said fiber guiding plate is substantially in the form of a sector and is stationarily arranged in said spinning chamber with the rear end portion thereof being opposed to said outlet opening of said fiber introducing channel.

3,908,350

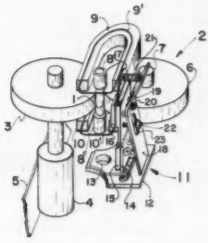
SPINDLE RETAINER

Robert B. Beagle, Graham, N.C., assignor to Dow Badische Company, Williamsburg, Va.

Filed Oct. 29, 1974, Ser. No. 518,317

Int. Cl.² D02G *1/04*; D01H *7/92*

U.S. Cl. 57—77.45 **5 Claims**



1. A retainer for a magnetically-supported false-twist spindle, which retainer comprises:

a. A base plate having mounting means for positioning and securing the retainer in proximity to the spindle to be retained;

b. A hinge plate secured to the base plate by pivot means for providing pivotal movement of the hinge plate from a vertical position in proximity to the spindle to a horizontal position away from the spindle, the hinge plate terminating at its free end in a shield section comprising a material having a durometer hardness less than that of the spindle, the shield section facing and in close proximity to, but not touching the spindle when the hinge plate is in the vertical position;

c. A locking lever having a single obliquity spaced from the medial point thereof, the locking lever being pivotally mounted on the side of the hinge plate away from the spindle, the obliquity functioning as a fulcrum, the upper end of the locking lever extending beyond the upper end of the hinge plate, and the lower end of the locking lever positioned in proximity to an edge of the base plate, so that the lower end of the locking lever rests on the base plate when the upper end of the locking lever is urged away from the spindle and the lower end of the locking lever is raised above the plane of the base plate and beyond an edge thereof when the upper end of the locking lever is urged toward the spindle; and

d. Resilient means urging the upper end of the locking lever away from the spindle.

3,908,351

NOVEL TIRE CORD FORMING PROCESS

Thomas D. Carroll, Shelby, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 27, 1973, Ser. No. 429,008

Int. Cl.² D02G *3/18*; D01H *13/28*, *13/30*

U.S. Cl. 57—162 **6 Claims**

1. In a method of coating glass fiber strand to produce an elastomeric coated glass fiber suitable for use in reinforcing rubber products, the steps comprising

introducing strand into a coating zone containing therein an elastomer compatible for use in reinforcing synthetic and natural rubber products,

applying to the glass fiber strand during its passage through the coating zone sufficient elastomeric coating to provide on the glass fiber sufficient elastomer after drying to maintain a weight percentage of between 18 to 40 per cent by weight elastomer basis the glass,

passing the coated strand from the coating zone through a high energy electrical drying zone to remove substantially all moisture contained therein,

passing the strand after drying through a curing zone operated at a temperature sufficient to substantially but not completely cure the elastomer contained on the surface of the glass,

imparting a twist to the elastomer coated glass strand emerging from the oven,

and collecting the strand in parallel rows on a bobbin within 5 to 15 seconds of the emergence of the strand from the curing oven.

3,908,352

BELL TONE APPARATUS FOR A CLOCK

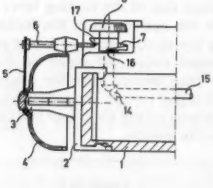
Albrecht Haag, Dauchingen, Germany, assignor to Keinzle Uhrenfabriken GmbH, Schwenningen, Germany

Filed May 30, 1974, Ser. No. 474,636

Claims priority, application Germany, Dec. 18, 1973, 7344754

Int. Cl.² G04B *21/00*

U.S. Cl. 58—9 **9 Claims**



1. A bell tone apparatus for attachment to a clock housing and adapted to be actuated at periodic intervals during the operation of the clock to provide an audible tone, the clock having at least one shaft which rotates in unison with the hands of the clock and having a portion which is accessible from the exterior of said housing, said apparatus comprising a bell, mounting means for attaching said bell to said clock housing, a hammer supported by said bell mounting means for movement adjacent said bell, a cam mounted on said accessible portion of said shaft for rotation with said shaft, said cam being located at a position adjacent said hammer for engaging said hammer to move said hammer progressively away from said bell as said shaft rotates, said cam being shaped to release said hammer from engagement therewith at a predetermined angular position of said rotating shaft whereby said released hammer is impelled back toward said bell to strike said bell and thereby provide an audible tone when said rotating shaft reaches said predetermined angular position.

3,908,353

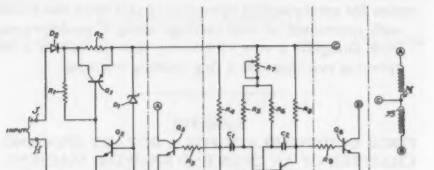
ELECTRIC TIMEPIECE DRIVE

Ronald M. Graziano, Saddle Brook, N.J., assignor to Engler Instrument Company, Jersey City, N.J.

Filed Oct. 9, 1973, Ser. No. 404,174

Int. Cl.² G04C *3/00*; G04B *19/02*

U.S. Cl. 58—23 A **13 Claims**



1. An electric timepiece drive including in combination a synchronous motor having a driving connection between the motor shaft and the timepiece mechanism, an electronic circuit including components which may be, for convenience, divided into a plurality of sections, namely first, a voltage regulator section having two terminals to receive the power input from a source at any voltage within a range between predetermined minimum and maximum voltage limits and whose output is a substantially constant voltage independent of the power input voltage, second, an astable multivibrator section to receive the output of said voltage regulator and whose outputs are two out-of-phase square wave signals at a predetermined frequency, third, two amplifier stages to receive the output of said multivibrator stage and whose output powers, fourth, a two-phase synchronous motor section:

a. said voltage regulator section being the source of power for all other sections and being constructed to operate with supply input voltage within a range between predetermined minimum and maximum limits of the order of 1 to 15 and comprising a plurality of components, namely,

1. a transistor (Q1) hereafter referred to as the first transistor which acts as a series resistance and whose collector is connected to one of the two power input terminals and whose emitter is connected to one of the two outputs of the voltage regulator section,

2. A resistance (R2) connected between said collector and emitter to lessen the power dissipation of said first transistor,

3. a voltage divider comprising a resistance (R1) which is connected between the collector and base of said first transistor, and another transistor hereafter referred to as the second transistor (Q2) whose collector is connected to the base of the first transistor and whose emitter is connected to the other input terminal which also forms the other output terminal,

4. a voltage reference element (D1) connected between the emitter of the first transistor and the base of the second transistor,

5. a resistance (R10) which is connected between the base and emitter of the second transistor,

6. a diode (D2) in series with the power input terminal to protect against accidental polarity reversal;

b. said stable multivibrator section which generates a specific predetermined frequency comprising as components;

1. at least two like transistors (Q4, Q5) operating in identical common-emitter amplifier circuits, the collectors of said transistors forming the output connections,

2. capacitors (C1 and C2) each connected from the collector of one of said like transistors to the base of

the other like transistor enabling regenerative feedback,

3. resistors (R4 and R8) connecting the collectors of the transistors (Q4 and Q5) respectively to the source of power,

4. resistance (R5, R6) connected from the base of each of said like transistors to one terminal of an adjustable resistance (R7) the other terminal of (R7) being connected to the source of power, these said resistances and capacitances forming an RC time constant which governs the frequency of operation of the multivibrator;

c. two amplifier sections comprising a resistance (R3) connected in series with the collector of transistor (Q4) and the base of another transistor (Q3) whose emitter is connected to the power input terminal and a resistance (R9) connected in series with the collector of (Q5) and the base of another transistor (Q6) whose emitter is connected to the power input terminal, the collectors of transistors (Q3) and (Q6) forming the output of the amplifier stages,

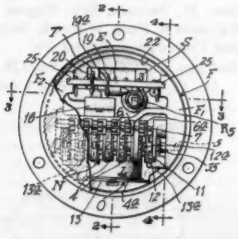
d. said two-phase synchronous motor section having connections to the outputs of said amplifier and power source and transducing the electrical signal outputs of said multivibrator into the mechanical form of a rotating shaft the angular rate of which is controlled by the frequency of the output of the said amplifier.

3,908,354

ELECTRIC TIMEPIECE DRIVE

Frank Tomasello, Bayonne, N.J., assignor to Engler Instrument Company, division of Sangamo Electric Company, Springfield, Ill.

Filed Sept. 20, 1974, Ser. No. 507,726
Int. Cl.² G04C *3/00*; **G04B** *5/20*
U.S. Cl. 58—23 D **7 Claims**



1. An electric timepiece drive comprising a solenoid drivingly connected to the timepiece and an electronic control circuit therefor, including components which may be for convenience, divided into a plurality of sections or stages, namely first, a voltage regulator having two input terminals to receive the power input from a source at any voltage within a range between predetermined minimum and maximum voltage limits of the order of 1 to 15 and two output terminals and whose output is substantially constant voltage independent of the power input voltage, said voltage regulator including at least one transistor which acts as a variable series resistance; second, a relaxation oscillator to receive the output of said voltage regulator which includes a complementary unijunction transistor and whose output is a sawtooth wave pulse at a predetermined frequency; and third, a solenoid electrically connected to the output of said oscillator and to said power source and means associated therewith, which transduces the electrical pulse output of said oscillator into the mechanical form of pulsating motion the rate of which is controlled by the output of said oscillator and which drives said timepiece.

3,908,355

ELECTROOPTICAL TIMEPIECE DISPLAY WITH CONVENTIONAL HOUR AND MINUTE HANDS

Leo Wiesner, Kew Gardens, N.Y., assignor to Timex Corporation, Waterbury, Conn.

Filed Feb. 13, 1975, Ser. No. 547,277
Int. Cl.² G04B *19/34*, *19/06*; **G08B** *23/00*
U.S. Cl. 58—50 R **8 Claims**

1. An electronic timepiece having an electrochromic display comprising:

a first substrate having a plurality of conductive hands formed thereon for indicating minutes, said first substrate being coated with electrochromic material at least over the area of the minute indicating hands;

a second substrate having a plurality of conductive hands formed thereon for indicating hours, said second substrate being coated with electrochromic material at least over the area of the hours indicating hands;

a counter electrode;

electrolyte means sealed between the first and second substrates such that it is in electrical contact with said counter electrode and the electrochromic material on the first and second substrates; and

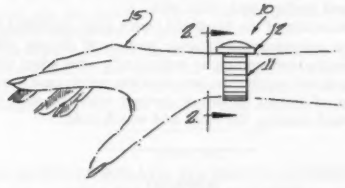
means for selectively applying a potential between one minute indicating hand and the counter electrode and between one hour hand and the counter electrode at a time so as to activate a hand and hands representative of time information in at least hours and minutes.

3,908,356

WATCH CASE AND BAND

William J. Williams, 102 Jeffrey Ct., Ashland, Ky. 41101

Filed Nov. 4, 1974, Ser. No. 520,264
Int. Cl.² G04B *37/00*
U.S. Cl. 58—88 W **1 Claim**



1. A watch case and band intended to be worn about a wrist of an individual, the watch case and band comprising, in combination:

a flat elongated expansion band having an interior surface and an exterior surface and opposed identical terminal ends, the band formed of a multitude of pivotally interconnected links to provide for the expansion and contraction of the band along the length of the band;

an elongated cylindrical bore extending transversely through each terminal end of the band between opposite side edges thereof;

the band being manufactured of copper material;

a rigid watch case of a rectangular box-like configuration having a solid flat horizontal bottom surface, a flat horizontal top surface, a pair of opposed vertical flat end wall surfaces, and a pair of opposed vertical flat side wall surfaces;

an open topped compartment defined interiorally of the watch case and opening out of the top surface of the watch case centrally thereof, the compartment adapted to receive therein a time keeping watch mechanism;

the watch case being manufactured of copper;

a pair of rectangularly shaped sockets each of an identical configuration, each socket defined in one of the end wall surfaces of the watch case and opening out of the end wall surface, the sockets being disposed in longitudinal alignment with each other;

each of the sockets being identical and being of a width and height slightly greater than the width and thickness respectively of the terminal ends of the watch band to receive the terminal ends therein;

each socket being of a sufficient depth to completely receive the terminal ends of the watch band completely therein, leaving no gaps, air spaces, and the like between the watch band and the watch case in a manner providing a continuous uninterrupted interior surface of copper material in contact with the skin of the individual when wearing the watch band about the individual's wrist;

a pair of axially aligned apertures extending longitudinally through the width of each of the sockets through opposite side walls thereof, the apertures extending completely through the side walls and opening out of the exterior surfaces of the side walls placing the socket in communication with the exterior of the side walls;

a pair of elongated hollow open ended cylindrical tubes, each tube passing axially through an associated one of the cylindrical bores in the terminal ends of the band;

a concentrically coiled spring disposed centrally in each of the cylindrical tubes and having its ends spaced inwardly of the cylindrical tubes;

a pair of pin members associated with each of the cylindrical tubes, each pin member being of a diameter less than the diameter of the interior of the cylindrical tubes and being telescopically received through opposite open ends of the cylindrical tubes with one end of each pin member engaging an adjacent end of the associated coil spring and with the opposite end of each pin member projecting outwardly of the cylindrical tube, the spring resiliently biasing the pins in a direction outwardly of the cylindrical tube;

the pin members being placed in axial registration with associated ones of the side wall apertures when the terminal end of the band is completely received in the socket with the pins engaging the side wall apertures and pivotally retaining the band to the watch case; and

the combination of the band and watch case providing a continuous uninterrupted interior surface of copper material completely surrounding an individual's wrist when wearing the band and watch case, and with the watch case providing a mass of copper in direct contact with the skin of the individual wearing the band and watch case.

3,908,357

RATCHET LOCKING ARRANGEMENT

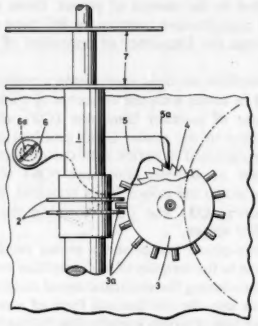
Friedrich Assmus, Schramberg, Germany, assignor to Gebruder Junghans GmbH, Schramberg, Germany

Filed Sept. 25, 1974, Ser. No. 509,314

Int. Cl.[2] G04B *15/00*; G04C *3/04*

U.S. Cl. 58—117 **2 Claims**

1. A ratchet locking arrangement for a battery clock advanced by the intermediary of a divider switch consisting of a pair of switching discs driven by a balance wheel which oscillates in a substantially horizontal plane, the arrangement comprising, in combination: a switching gear having a number of teeth thereon for cooperation with said pair of switching discs secured to the shaft of said balance wheel; a locking wheel coaxial and operatively associated with said switching gear; a number of teeth on said locking wheel; a locking ratchet adjustably supported on a stationary part of the clock, pivotable in a substantially vertical plane, for engagement with said locking teeth by way of an operative tip portion thereon; and an eccentric interposed between said stationary part and



a terminal portion of said ratchet, spaced apart from said tip portion, said eccentric constituting single adjusting means for the proper positioning of said switching teeth with respect to said discs; wherein said ratchet has a weight sufficient to make positive engagement with successive bases of said locking teeth after said switching gear and said locking wheel have been advanced by one step as a result of the oscillation of said balance wheel.

3,908,358

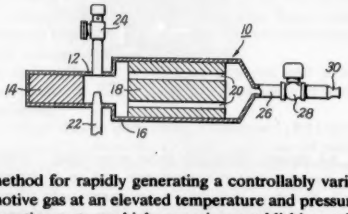
VARIABLE FLOW GAS GENERATING METHOD AND SYSTEM

Ernest S. Sutton, Jr., Newark, Del.; Eugene J. Pacanowsky, Elkton, and Donald R. Reed, Warwick, both of Md., assignors to Thiokol Corporation, Bristol, Pa.

Filed Jan. 31, 1973, Ser. No. 328,496

Int. Cl. F02g *3/00*; F02k *9/04*

U.S. Cl. 60—39.03 **15 Claims**



1. A method for rapidly generating a controllably variable flow of motive gas at an elevated temperature and pressure in a gas generating system which comprises establishing at least one body of a combustion supporting gas generating material comprising a combustible elastomeric fuel-binder and an inorganic oxidizer in such proportions as to be capable, when ignited, of supporting and sustaining combustion of said material in the absence of air and external energy, establishing at least one body of a non-combustion supporting combustible gas generating material comprising a combustible elastomeric fuel-binder and an inorganic oxidizer in such proportions as to be capable, when ignited, of supporting and sustaining combustion, and a combustion suppressant in such proportions that said body of non-combustion supporting gas generating material will produce gaseous combustion products only in the presence of an external source of thermal energy, igniting said body of said combustion supporting gas generating material to cause it to produce hot gaseous combustion products, passing at least a portion of said combustion products over a body of

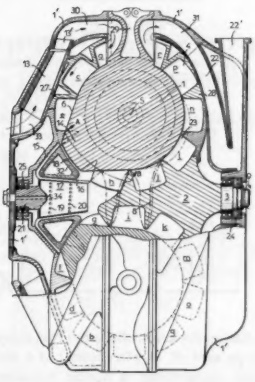
said non-combustion supporting gas generating material to cause it to produce additional gaseous combustion products and regulating the proportion of gaseous products from said combustion supporting body passed into contact with said non-combustion supporting body to control the total gas output of said system.

3,908,359

ENGINES AND COMPRESSORS OF THE KIND IN WHICH A VALVE DEVICE ENGAGES WITH A HELICOIDAL ROTOR

Ferdinand Jeandel, Paris, France, assignor to Etablissements Pompes Guinard, France

Division of Ser. No. 210,710, Dec. 22, 1971, Pat. No. 3,810,722. This application Oct. 26, 1973, Ser. No. 409,782
Claims priority, application France, Dec. 16, 1970, 70.45340; Nov. 29, 1971, 71.42621
Int. Cl.² F02B *53/00*
U.S. Cl. 60—39.45 **7 Claims**



1. Rotary machine which can be used as one of a motor, a motor-compressor and the like, comprising;

a first and a second body of revolution, one of which is stationary, the other rotatory, the first body of revolution being hollow with an axial central part defining the axis of the machine and the second body being solid and completely surrounded by the said first body; at least one helicoidal-spiral groove in the surface of the first body;

at least one valve device with peripheral vanes rotatable in a longitudinal plane of symmetry of the first body, the vanes engaging in the groove in the first body, the wall of the second body co-operating with the vanes to limit succesive chambers of variable volume for changing pressure in a mixture of compressed fluid with injected fuel,

a combustion chamber for burning the said mixture, the second body having at least one projecting part, also in form of a body of revolution,

the said first body, the surface of which is provided with the said helicoidal-spiral groove, having at least one wall part, obtained by a complete truncature of the ribs of the helicoidal-spiral groove in the region facing said projecting part and having a shape complementary thereto, there being very little clearance between these parts, the machine comprising also

channel means provided in the said first body, having a reduced cross-section and being located in the machine so as to conduct the fluid from the end of the helicoidal-spiral groove, situated above the said projecting part in the direction of flow of the circulating fluid, through the said combustion chamber to the part of the helicoidal-spiral groove situated below the said projecting part;

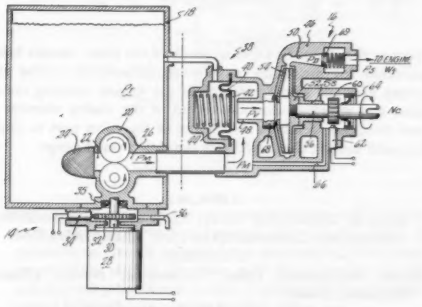
the said projecting part of the second body and the said completely truncated part of the first body and directing the fluid into the said channel means in such a manner that the fluid is subjected to an additional greater compression upstream of the combustion chamber.

3,908,360

PUMP METERING FUEL CONTROL SYSTEM

Gene A. Meyer, West Simsbury, and John S. Jenkins, Simsbury, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Continuation-in-part of Ser. No. 330,603, Feb. 8, 1973, abandoned. This application Jan. 14, 1974, Ser. No. 433,229
Int. Cl.² F02C *9/06*
U.S. Cl. 60—39.28 R **8 Claims**



1. A fuel control system for an engine comprising:

a computer scheduling section to sense selected engine parameters and to generate a fuel flow signal indicative of a scheduled fuel flow;

a positive displacement metering pump for pumping a metered fuel flow to the engine, the fuel flow increasing with the speed of the metering pump;

a variable speed drive mechanism drivingly connected to the metering pump to run the metering pump;

means for generating a feedback signal indicative of the actual speed of the metering pump;

a computer control section, having a summing means, operatively connected to the variable speed drive mechanism for controlling the speed thereof and hence the speed of the pump, the summing means being adapted to receive and sum the fuel flow signal and the feedback signal for generating an error signal; and

a throttling type differential pressure regulator operatively connected to the pump for maintaining a substantially constant pressure head across the pump to linearize the relationship between the fuel flow and the pump speed.

3,908,361

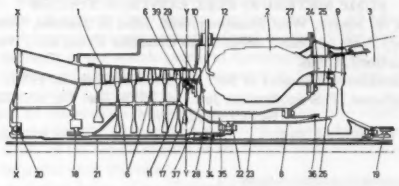
SEAL BETWEEN RELATIVELY MOVING COMPONENTS OF A FLUID FLOW MACHINE

Terence Edward Gouvenot Gardiner, Bristol, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Dec. 14, 1973, Ser. No. 424,762
Claims priority, application United Kingdom, Dec. 16, 1972, 58223/72
Int. Cl.² F02C *7/20;* **F01D** *11/06*
U.S. Cl. 60—39.32 **7 Claims**

1. A gas turbine engine having a casing, a rotor, and a seal therebetween, said seal comprising a first sealing member carried by a part of the rotor and a second sealing member carried by an element of the casing and spaced from the first sealing member to define a sealing clearance therebetween,

wherein the rotor part is adapted to move under various engine running conditions to vary the sealing clearance, means are provided for fixing the casing to static structure at one end away from the casing element, and at the other end there is provided a joint between the casing element and static structure which allows freedom of movement of said casing element in the direction of movement of the rotor, means being provided for producing a pressure differential across said casing element which varies with the engine running conditions and which causes movement of the casing element in said direction to follow movement of the rotor part to maintain said sealing clearance in a pre-determined range.



3,908,362

BYPASS TURBOJET WITH VARIABLE PITCH LOW PRESSURE COMPRESSOR FOR THERMAL LOAD CONTROL

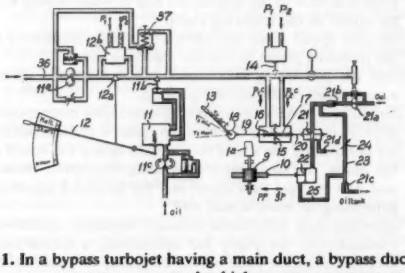
Joseph Szydlowski, Usine Turbomeca, Bordes (Basses-Pyrenees), France

Filed Apr. 27, 1971, Ser. No. 137,819

Claims priority, application France, June 29, 1970, 70.23976

Int. Cl. F02c *3/06, 9/04, 9/14*

U.S. Cl. 60—226 R 3 Claims



1. In a bypass turbojet having a main duct, a bypass duct, a low pressure compressor and a high pressure compressor in series flow with the low pressure compressor and disposed in the main duct, the low pressure compressor additionally feeding the bypass duct and turbine means for actuating the compressors, the improvements which comprise:

a. the low pressure compressor having variable pitch blading disposed in both the bypass duct and the main duct; b. tachometric fuel metering means for maintaining a constant rotational speed of the turbine means;

c. a servomechanism operatively connected to the variable pitch blading of the low pressure compressor; and

d. a thermal load limiter for regulating the temperature ahead of the turbine means and operatively connected to the servomechanism including means responsive to the instantaneous actual fuel flow to the turbine means as compared to the theoretical maximum flow rate which can be admitted to the turbine means and generating a signal proportional thereto,

e. means responsive to the signal for automatically reducing the blade pitch as soon and as long as either the actual turbine means temperature or the actual rate of fuel flow tends to exceed its upper limit,

f. the means responsive to the signal automatically increasing the blade pitch as soon as either the difference between the actual rate of fuel flow and its lower limit or the fuel feeding in flight for the turbine means tends to a zero valve.

3,908,363

AERO GAS TURBINE AFTERBURNER CONTROL

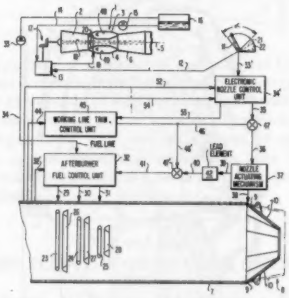
Klaus Bauerfeind, Munich, Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Germany

Continuation-in-part of Ser. No. 128,663, March 29, 1971, abandoned. This application July 2, 1973, Ser. No. 375,903

Claims priority, application Germany, Apr. 11, 1970, 2017380

Int. Cl.[2] F02K *1/18*

U.S. Cl. 60—237 31 Claims



1. An installation for controlling the fuel supply to, and the nozzle discharge area of, an afterburner of a turbo jet engine; said installation comprising: a nozzle actuating mechanism including means for varying the nozzlle discharge area in response to a nozzle actuating input signal, variable position preselector means for directly controlling said actuating input signal as a function of the position of said preselector means, an afterburner fuel control unit for varying the fuel supply as a direct function of a degree of afterburning signal supplied thereto, connecting means operatively connected to said nozzle actuating mechanism for directly controlling said degree of afterburning signal as a direct function of the actual discharge nozzle area, and working line trim control means of limited authority responsive to changes in at least one engine operating parameter for varying said nozzle actuating input signal while maintaining said degree of afterburning signal constant until the difference between predetermined desired and actual values of said at least one engine operating parameter becomes zero.

3,908,364

PUTTY PROPELLANT STRESS RELIEF SYSTEM

Clarence A. LeFebvre, and Lewis L. Schoen, both of San Jose, Calif., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 19, 1973, Ser. No. 324,940

Int. Cl. F02k *9/00*

U.S. Cl. 60—252 2 Claims

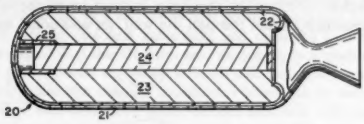
1. A rocket motor utilizing a flowable propellant in a non-flowing combustion mode comprising:

a. a combustion chamber;

b. a mass of flowable propellant disposed within said combustion chamber said mass of propellant having a rear surface spaced apart from the aft end of said combustion

chamber whereby said propellant is free to expand rearwardly within said combustion chamber;

c) a flexible membrane disposed about said propellant and containing at least said rear surface, said membrane and said propellant being formed into an annular rearwardly convex convolute around the rear surface of said propellant;



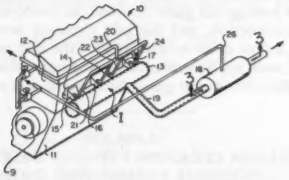
d. anti-slump means supported axially within said combustion chamber and slidable axially therein said anti-slump means supportingly engaging said membrane whereby the configuration of the rear surface of said propellant mass is maintained while axial expansion and contraction of said propellant mass is permitted.

3,908,365

TREATMENT OF GASEOUS EFFLUENT

Donald J. Schweibold, Toledo, Ohio, and David R. Bentley, Temperance, Mich., assignors to Questor Corporation, Toledo, Ohio

Filed Apr. 13, 1972, Ser. No. 243,606
Int. Cl.² F01N *3/14, 3/16*
U.S. Cl. 60—274 **13 Claims**



1. A process for minimizing emission of noxious substances from an effluent of an internal combustion engine coating containing carbon monoxide, hydrocarbons, and oxides of nitrogen, which process comprises the steps of, sequentially:

a. Oxidizing only a portion of the total oxidizable components in the effluent to raise its temperature to at least 1,550°F. by introducing an oxygen-containing gas into said effluent, said oxidation being such that the remaining carbon monoxide content of the effluent is substantially in excess of the stoichometric amount of oxides of nitrogen therein;

b. Exposing said effluent to an environment to chemically reduce a substantial part of the oxides of nitrogen; and

c. Exposing said effluent to an oxygen-containing gas in a non-catalytic environment, to effect flame oxidation at a temperature of at least 1,550°F. to oxidize oxidizable components remaining in said effluent.

3,908,366

MISFIRING DETECTOR FOR INTERNAL COMBUSTION ENGINES

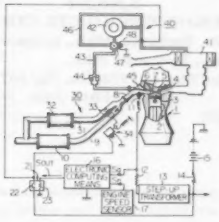
Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed June 15, 1973, Ser. No. 370,369
Claims priority, application Japan, June 17, 1972, 47-60845; June 17, 1972, 47-60846
Int. Cl.² F02B *75/10*
U.S. Cl. 60—277 **9 Claims**

1. In an internal combustion engine having at least one combustion chamber, an exhaust system including an exhaust port opening to said combustion chamber, an exhaust manifold, two exhaust pipes connected with said exhaust manifold, and an exhaust gas purifying means disposed in one of said exhaust pipes; a protective system for preventing said exhaust gas purifying means from being destroyed by unburned gas emitted from said combustion chamber in the event that a misfire occurs in said combustion chamber, which system comprises:

a gas current pulse generator disposed in said exhaust manifold in the vicinity of said exhaust port, said gas current pulse generator having electrodes forming an ion-gap for generating gas current pulse signal when a high temperature burned gas is emitted through said ion-gap from said combustion chamber;

an engine speed sensor driven by said engine for producing an engine pulse signal with a repetition rate proportional to the speed of said engine;



an electronic computing means responsive to said gas current pulse signal and said engine speed pulse signal to produce an electric output signal representing the occurrence of the misfire when the ratio of the number of said gas current pulse signal to that of said engine speed pulse signal is less than a predetermined value;

bypass valve means disposed in said exhaust pipes for preventing said unburned gas from passing through said exhaust gas purifying means;

a solenoid actuator for actuating said bypass valve means; and

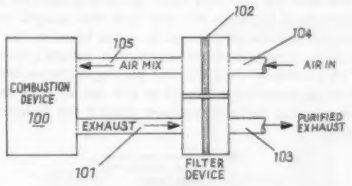
electric energizing means for energizing said solenoid actuator in response to said output signal from said electronic computing means and storing a misfiring condition.

3,908,367

PROCESS AND APPARATUS FOR CLEANING EXHAUST FUMES

Dieter Bauman, Nachtigallenstrasse 60, 6078 Neu Isenburg 2, Germany

Filed July 10, 1973, Ser. No. 377,959
Int. Cl.² F01N *3/15*
U.S. Cl. 60—280 **2 Claims**



1. An apparatus for cleaning exhaust fumes from a combustion device which comprises a first conduit means defining a first flow path communicating with the combustion device to receive exhaust fumes outflowing therefrom; a second conduit means defining a second flow path communicating with said combustion device to deliver an intake gas flow thereto; a filter disposed for movement relative to said first and second conduit means and positioned to intercept said first and sec-

ond flow paths, the area of the filter intercepted by said first flow path being operable to clean exhaust fumes flowing in a given direction through the filter and trap solid particle components thereof; the area of the filter intercepted by said second flow path being cleaned by the intake gas flowing in the opposite direction through the filter and removing trapped solid particles therefrom; such removed particles being carried by the intake gas into the combustion device; means for cyclically moving said filter to successively present for interception with said second flow path for cleaning those areas of the filter previously intercepted by said first flow path and to sucessively present cleaned filter areas for interception with said first flow path said filter being in the form of an endless belt ; and rotatable means supporting said belt and moving same through said first and second flow paths.

3,908,368

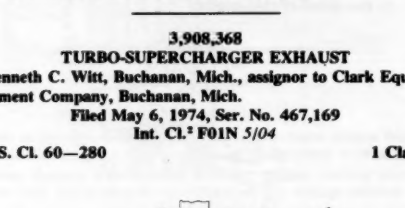
TURBO-SUPERCHARGER EXHAUST

Kenneth C. Witt, Buchanan, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed May 6, 1974, Ser. No. 467,169

Int. Cl.² F01N *5/04*

U.S. Cl. 60—280 **1 Claim**



1. An exhaust construction for a turbo-super-charger on an engine, having a wall adjacent the engine through which exhaust gases are discharged, comprising a first rigid conduit member connected to and extending away from the turbo-supercharger, a first baffle portion attached to the outer extremity of the said first conduit member, a second rigid conduit member secured to and extending through the wall, the said second conduit member having its entrance end aligned with the said first conduit member for receiving exhaust gases therefrom and transmitting them through the wall, an additional baffle portion attached to the said entrance end of the second conduit member, the said additional baffle portion interposed with the said first baffle portion to provide a non-rigid connection between the said first and second conduit members and a tortuous passage for gases between the inside and the outer terminus of the connection, means providing a flow of air externally over the said non-rigid connection, and the said outer terminus arranged so that the air flow tends to force air into the tortuous passage toward the inside of the connection.

3,908,369

TURBO-SUPERCHARGER EXHAUST

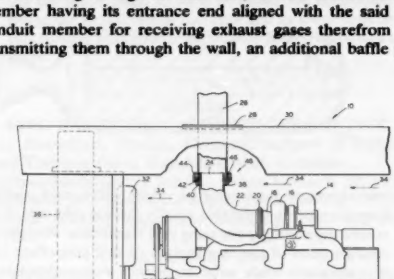
Paul F. McAdams, St. Joseph, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed May 6, 1974, Ser. No. 467,171

Int. Cl.² F01N *5/04*

U.S. Cl. 60—280 **5 Claims**

5. The combination of an internal combustion engine having a turbo-supercharger thereon and a fan arranged to move cooling air over the engine and turbo-supercharger, a wall adjacent the engine through which exhaust gases are discharged, a first rigid exhaust conduit member connected to and extending away from the said turbo-supercharger, a first baffle portion attached to the outer extremity of the said first conduit member, a second rigid conduit member secured to and extending through the said wall, the said second conduit member having its entrance end aligned with the said first conduit member for receiving exhaust gases therefrom and transmitting them through the wall, an additional baffle portion attached to the said entrance end of the second conduit member, the said additional baffle portion interposed with the said first baffle portion to provide a non-rigid connection between the said first and second conduit members and a tortuous passage for gases between the inside and the outside of the connection, and the said elements arranged so that there is a flow of air externally past the said non-rigid conanection, such air flow direction being transverse to the direction of flow of exhaust gases through the said connection.



3,908,370

SYSTEM FOR CLEANING EXHAUST GASES FROM AN INTERNAL COMBUSTION ENGINE

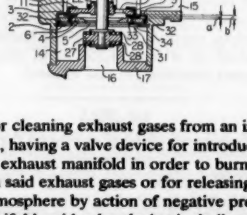
Osamu Kuroda, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed July 25, 1974, Ser. No. 491,632

Claims priority, application Japan, May 22, 1974, 49-57411

Int. Cl.² F01N *3/10*

U.S. Cl. 60—290 **4 Claims**



1. System for cleaning exhaust gases from an internal combustion engine, having a valve device for introducing the flow of air into the exhaust manifold in order to burn the unburnt components in said exhaust gases or for releasing said flow of air into the atmosphere by action of negative pressure within the intake manifold, said valve device including:

a casing defining therein first and second chambers separated by a valve seat having a first valve port at the center thereof, and having second valve ports at the outer periphery thereof, said first chamber being in communication with an air supply operated by said engine, said second chamber being in communication with the atmosphere,

a third chamber defined in one part of said casing, said third chamber being in communication with said intake manifold,

a passageway defined in another part of said casing, said passageway communicating said first chamber with the exhaust manifold,

a first valve plate connected to a diaphragm arranged in said third chamber by a rod; in its first position said first valve plate closing said first valve port and releasing said passageway so that the air from said air supply is introduced into said exhaust manifold to burn said unburnt components within the exhaust manifold, whereas in its second position said first valve plate releases said first valve port and closes said passageway so that the air from said air supply is released into the atmosphere, and

a second valve plate for controlling the pressure in said system, said second valve plate being resiliently urged toward said second valve ports, wherein said valve device comprises:

a stop means secured to the inner wall of the casing, said means holding said second valve at a distance from said second valve ports when said first valve is in its second position.

3,908,371

APPARATUS FOR SUPPLYING FUEL TO A DUAL-CATALYST EXHAUST TREATMENT SYSTEM

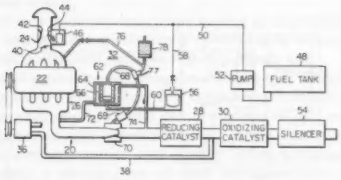
Tadashi Nagai; Hitoshi Irikura, and Kiminobu Sasa, all of Yokosuka, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Nov. 16, 1972, Ser. No. 307,234

Claims priority, application Japan, Dec. 29, 1971, 46-472783

Int. Cl.² F01N *3/14, 3/16*

U.S. Cl. 60—301 **3 Claims**



1. A combination with a motor vehicle engine which is adapted to be operated on an air-fuel mixture proportioned to an air-to-fuel ratio in a range between a stoichiometric air-to-fuel ratio and a value appreciably higher than the stoichiometric air-to-fuel ratio, of an exhaust cleaning system which comprises reducing an oxidizing catalyst means which are incorporated in an exhaust system of said engine, said oxidizing catalyst means being located posterior to said reducing catalyst means, reducing agent supply means for supplying a reducing agent to said exhaust system upstream of said reducing catalyst means for removing an excess of oxygen and reducing nitrogen oxides in the exhaust gases passed through said reducing catalyst means, said reducing agent supply means including fuel storage means receiving a fuel from a fuel tank of said engine, and fuel evaporator means for evaporating the fuel delivered from said fuel storage means and feeding the resultant evaporated fuel to said exhaust system upstream of said reducing catalyst means, said fuel evaporator means including a fuel evaporating chamber having an inlet communicating with said fuel storage means and an outlet communicating with said exhaust system upstream of said reducing catalyst means and a heating chamber which is in contact with said fuel evaporating chamber and which has an inlet and outlet communicating respectively with said exhaust system upstream and downstream of an outlet of a pipeline leading from the outlet of said fuel evaporating chamber for heating and evaporating the liquid fuel in said fuel evaporating chamber by transfer of heat to said fuel evaporating chamber from the hot exhaust gases circulated through said heating chamber, and secondary air supply means for supplying secondary air to the exhaust system intervening between said reducing and oxidizing catalyst means for oxidizing carbon monoxide and hydrocarbons in the exhaust system passed through the oxidizing catalyst means.

3,908,372

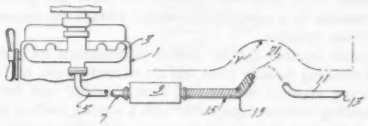
HEAT SHIELD FOR EXHAUST CONDUITS

Charles P. Fowler, Jackson, and Robert N. Balluff, Rives Junction, both of Mich., assignors to Tenneco Inc., Racine, Wis.

Filed Aug. 15, 1974, Ser. No. 497,672

Int. Cl.² F01N *3/14;* **F16L** *11/00*

U.S. Cl. 60—320 **1 Claim**



1. In an internal combustion engine exhaust system including a gas treating device and a horizontally extending exhaust gas flow conduit having an outer surface and connected in series to the device, a heat shield mounted on the conduit and comprising a series of longitudinally overlapping annular coils that are longitudinally adjustable relative to each other whereby they may be fitted over bends in the conduit while substantially maintaining longitudinal contact with adjacent coils, each of said coils having a transverse flange along one edge that contacts the outer surface of the conduit to space the coil from said outer surface, the other edge of the coil slidably fitting on the outside of the flanged edge of the adjacent coil, the space between the coil and the outer surface of the conduit comprising an air gap, at least the top half of said coils being imperforate, the bottom half of said coils containing apertures to provide for the flow of air through the coil, said coils comprising interconnected turns of a helically coiled metal strip.

3,908,373

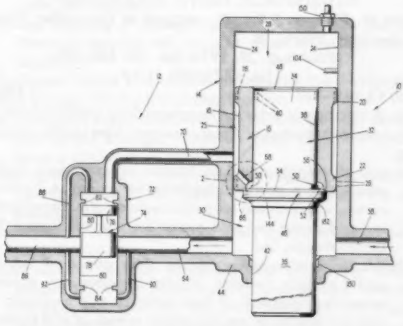
HIGH ENERGY RATE ACTUATOR

Carl R. Peterson, Boxford, Mass., assignor to Foster-Miller Associates, Waltham, Mass.

Continuation-in-part of Ser. No. 91,651, Nov. 23, 1970, abandoned. This application May 1, 1972, Ser. No. 249,214

Int. Cl.² F01B *7/18;* **F01L** *25/04*

U.S. Cl. 60—371 **23 Claims**



1. A high energy linear actuator comprising:

a cylinder having first and second ends;

a member having first and second ends and being movable reciprocably within said cylinder and defining in cooperation with the cylinder a first chamber adjacent the first end of said cylinder;

a piston reciprocable along the axis of said cylinder and having a first end extending outwardly of the first end of said cylinder defining the first chamber and having a second end within a bore in said member for reciprocating movement both relative to and in unison with said member, said first end of said piston which extends outwardly of the first end of the cylinder passing through the first chamber;

means connected to said cylinder for developing a pressure in said first chamber, said piston and said member having surfaces exposed in said first chamber and adapted to receive a component of said pressure in an axial direction away from said first chamber to move the piston and member in a compression stroke toward the second end of the cylinder,

a collar secured to said piston intermediate its ends and extending radially from and about said piston, said collar being exposed within said first chamber and having a sealing surface engageable with a seating surface formed on the first end of said member, said collar having a first surface facing said first chamber, said first surface comprising said surface adapted to receive a component of said pressure in an axial direction within said first chamber; and

means for maintaining the pressure on said sealing surface of said collar at a level which is lower than that acting on the first surface of said collar during said compression stroke, the pressure differential between the lower pressure on the sealing surface and the higher pressure on the first surface maintaining a seal between the piston and member causing unitary movement of the piston and member during the compression stroke;

energy storage means connected to said piston for storing energy developed by said unitary movement of said member and said piston and for exerting a component of force on said piston in an axial direction toward said first chamber; and

means for equalizing substantially all forces acting on said piston within said cylinder except for the force of said energy storage means whereby said stored energy may urge said piston at a high velocity toward said first end of said cylinder in a power stroke.

3,908,374

HYDROSTATIC DRIVE ARRANGEMENT

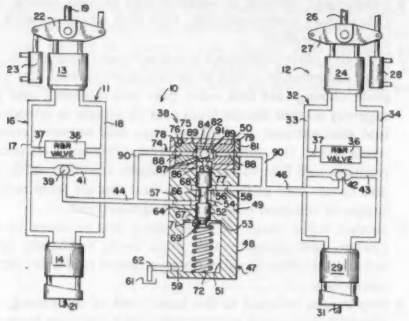
Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Aug. 28, 1974, Ser. No. 501,209
Int. Cl.[2] F15B *11/22*
U.S. Cl. 60—420 **7 Claims**

1. A hydrostatic drive arrangement for a vehicle providing synchronized rotation of a pair of output drive shafts, comprising;

a pair of variable speed hydrostatic transmissions each of which has a positive displacement pump, a hydraulic motor, and a closed loop hydraulic system interconnecting said pump and said motor for communicating fluid therebetween; and

hydraulic synchronizing means interconnected between said hydraulic systems of said transmissions normally permitting interflow of fluid between said hydraulic systems for synchronizing the output speeds of said transmission when the fluid pressure in said hydraulic systems is below a predetermined value, said synchronizing means being responsive to fluid pressures in said hydraulic systems to block interflow therebetween when the fluid



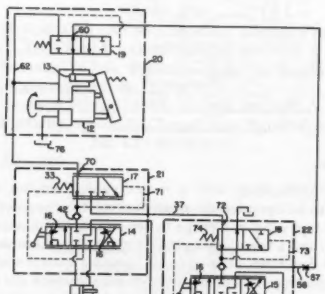
pressure in one of said hydraulic systems exceeds said predetermined value.

3,908,375

HYDRAULIC LOAD SENSITIVE PRESSURE AND FLOW COMPENSATING SYSTEM

John E. G. Young, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Sept. 25, 1974, Ser. No. 508,977
Int. Cl.[2] F16H *39/46*; F15B *11/16*
U.S. Cl. 60—422 **9 Claims**



1. A hydraulic load sensitive pressure and flow compensating sytem for selectively controlling operation of a plurality of hydraulic motors including a variable delivery pump having a stroke control cylinder and supplying fluid to the motors through respective motor control valves having variable restricting orifices wherein the improvement comprises;

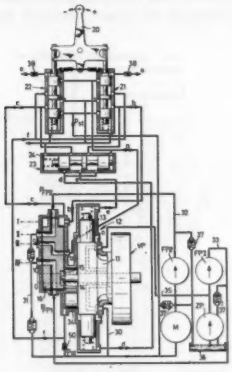
a. pressure sensitive flow dividing means connecting the control valves for delivering surplus flow from one control valve to the next in order according to priority, and

b. pressure and flow compensating valve means sensing a differential pressure across a restricting orifice of the last of the control valves in the order of priority for governing the delivery of the variable delivery pump by selectively alternately applying pressure to and releasing pressure from the stroke control cylinder.

3,908,376
HYDROSTATIC TRANSMISSION

Anton Steiger, Illnau, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 13, 1974, Ser. No. 469,541
Claims priority, application Switzerland, May 17, 1973, 7031/73
Int. Cl.² F15B *13/09*
U.S. Cl. 60—428 **11 Claims**



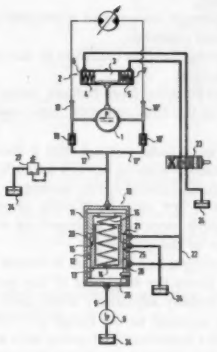
1. A hydrostatic transmission comprising
a motor;
a variable-delivery pump having a variable-delivery volume and being connected to said motor for driving said motor, said pump being operable in a range between two extreme values;
at least one fixed-delivery pump having an invariable-delivery rate and being selectively connected to said motor in parallel with said variable-delivery pump; and
a control means for adjusting the delivery rate of said variable-delivery pump and for selectively connecting and disconnecting said fixed delivery pump to said motor in response to said variable-delivery pump reaching one of said extreme values, said control means simultaneously causing a change-over of said variable-delivery pump from said one extreme value to the other extreme value upon said latter pump reaching said one extreme value.

3,908,377
CONTROL SYSTEM FOR A HYDROSTATIC TRANSMISSION

Josef Riedhammer, Ulm (Danube), Germany, assignor to Hydromatik GmbH, Ulm (Danube), Germany

Filed Sept. 14, 1973, Ser. No. 397,443
Claims priority, application Germany, Sept. 27, 1972, 2247437
Int. Cl.² F16H *39/46*
U.S. Cl. 60—445 **3 Claims**

1. A fluid system comprising a pump, a fluid motor connected in a circuit with and driven by the output of said pump, means for varying the fluid capacity of said circuit, and an auxiliary pump wherein the auxiliary pump feeds hydraulic fluid through a throttle orifice and a feed pipe into the circuit to make good leakage loss, and part of the hydraulic fluid delivered by the auxiliary pump is tapped off by a bleeder valve and diverted through a bleeder pipe for controlling said means for varying the fluid capacity, the bleeder valve having a first port connected to the bleeder pipe and a second port connected to exhaust and a valve member for controlling the pressure in the bleeder pipe and which is displaceable in one direction by the pressure drop across the throttle orifice, against the resistance of a restoring spring, to open the first port and to connect the bleeder pipe to the auxiliary pump delivery, and in the opposite direction to open the second port and to connect the bleeder pipe to exhaust, the valve member

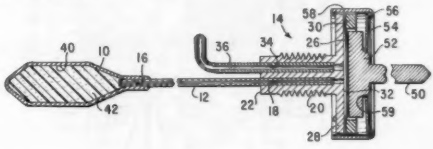


having at least one additional working face to which the pressure in the bleeder pipe is applied in the same direction as the spring force and wherein the valve member is in the form of a piston and contains the throttle orifice.

3,908,378
FLUID PRESSURE RESPONSIVE DEVICE

Denis G. Wolfe, and Hugh J. Tyler, both of Santa Ana, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 14, 1973, Ser. No. 415,881
Int. Cl.² F01B *19/02;* **F15B** *15/02;* **F16F** *1/34;* **G01K** *5/32*
U.S. Cl. 60—527 **9 Claims**



1. A thermal responsive device comprising
means forming a first chamber;
a charge of thermal expandable fluid in the first chamber;
a support member;
a flexible diaphragm secured to the support member and extending over a portion of the support member to form a second chamber;
means defining a passage communicating from the first chamber through the support member to the second chamber;
a plunger having a head portion engaging the diaphragm;
said plunger having a shoulder thereon;
a nearly-flat frusto-conical spring surrounding the plunger and having a height within the range from 0.4 to 2.83 times a thickness of the spring;
said spring having its inner periphery engaging the shoulder with the apex of the spring extending toward the diaphragm;
an annular retainer having an inner lip engaging the outer periphery of the spring; and
said annular retainer extending over and being initially adjustably secured to the support member so as to set the spring in a range where the spring has a force differential coefficient which is substantially less than the force differential coefficient of a linear spring.

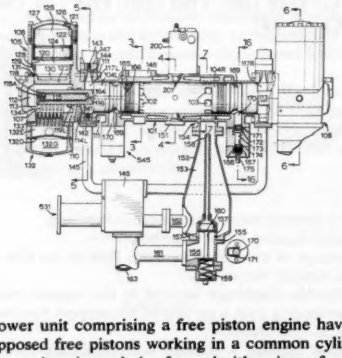
9. A thermal responsive device comprising
a metal bulb forming a first chamber;
a quantity of carbonized polyvinylidene chloride in the first chamber;
a support member having a flange portion with a substantially flat face;
a flexible diaphragm secured to a periphery of the face to form a second chamber;
a tube connecting the first chamber to the second chamber through the face;
a charge of gas selected from helium, neon, argon, krypton and xenon in the first chamber, tube and second chamber;
a plunger having a head portion with a shoulder;
an annular retainer with an inward extending lip;
a nearly-flat frusto-conical spring having an outer periphery engaged on a first side by the lip of the retainer and having an inner periphery engaged on a second side by the shoulder of the plunger;
said spring having a height which is within the range from 0.4 to 2.83 times the thickness of the spring; and
said retainer initially adjustably telescoped over the flange portion and secured to the flange portion such as to set the nearly-flat frusto-conical spring into a range of operation where the spring has a force differential coefficient of a linear spring.

3,908,379

OPPOSED FREE PISTON ENGINE HAVING START, STOP, AND RESTART CONTROL MEANS

William Maurice Bard Fitzgerald, R.R. No. 1, Claremount, Ontario, Canada

Division of Ser. No. 305,453, Nov. 10, 1972, Pat. No. 3,841,797. This application Sept. 9, 1974, Ser. No. 504,729
Int. Cl. F02b *71/04*
U.S. Cl. 60—595 **9 Claims**



1. A power unit comprising a free piston engine having a pair of opposed free pistons working in a common cylinder, each of the engine pistons being formed with a circumferential groove which in one position of the piston registers with a retractable plunger which is radially movable from a retracted position to a piston-engaging position, the plunger being normally retained by a spring both in the retracted position and the piston-engaging position and being urged into its piston-engaging position by hydraulic means.

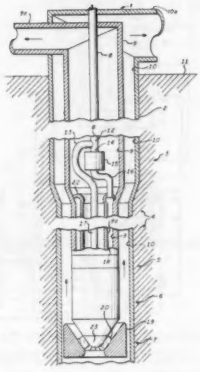
3,908,380

GEOTHERMAL ENERGY TURBINE AND WELL SYSTEM

James L. Lobach, Denver, Colo., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 15, 1974, Ser. No. 488,331
Int. Cl.² F03G *7/00*; F01K *23/00*
U.S. Cl. 60—641 **13 Claims**

1. In geothermal deep well pump apparatus located at a subterranean source of geothermal will fluid and of the kind including geothermal energy exchange means for providing a working fluid and pump means for puming said geothermal well fluid always in liquid state for flow in cooperative energy exchange relation with respect to said geothermal energy exchange means toward the earth's surface:
rotor means coupled by shaft means for driving said pump means,
annular conduit means for directing flow of said working fluid from said geothermal energy exchange means generally in a first direction in energy exchanging flow with



respect to said rotor means for driving said rotor means, annular working fluid redirecting conduit means at said rotor means opposite said annular conduit means for generally reversing the direction of flow of said working fluid,
said rotor means having rotor passage way means about said shaft means for permitting passage of said redirected working fluid therethrough in a second direction generally opposite said first direction after said working fluid has yielded energy to said rotor means.

3,908,381

GEOTHERMAL ENERGY CONVERSION SYSTEM FOR MAXIMUM ENERGY EXTRACTION

Robert E. Barber; Kenneth E. Nichols, both of Arvada, and Daryl R. Prigmore, Wheatridge, all of Colo., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 20, 1974, Ser. No. 525,534
Int. Cl.² F03G *7/00*
U.S. Cl. 60—641 **9 Claims**

1. In geothermal deep well pump apparatus of the kind including geothermal energy exchange means for providing a working fluid, motor driven pump means responsive to said working fluid for pumping geothermal fluid always in liquid state for flow in cooperative energy exchange relation with respect to said geothermal energy exchange means to a remote station, and means for conveying said working fluid, after driving said motor driven pump means, to said remote station, energy conversion means at said remote station comprising:
first conduit means for conveying said geothermal fluid through first heat exchanger means,
second heat exchanger means in cooperative thermal energy exchange relation with said first heat exchanger means for heating and conveying an organic fluid having a lower boiling point than said geothermal fluid,
a plurality of flash tank means operating at successively decreasing pressure levels for separating said organic

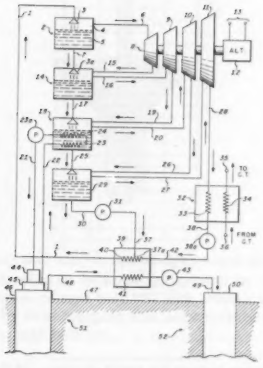
fluid into finite organic vapor and organic liquid portions within each said flash tank means,

turbine motor means having a plurality of stages for driving power generator means,

second conduit means for supplying said organic fluid from said second heat exchanger means to the first of said plurality of flash tank means,

plural vapor conduit means for coupling said organic vapor portions from each said respective flash tank means for driving corresponding stages of said turbine motor means,

plural liquid conduit means for coupling said organic



liquid portions from each respective flash tank means into a next succeeding flash tank means except for the last of said plurality of flash tank means,

plural turbine exhaust conduit means for coupling respective outputs of said plurality of turbine stages to respective inputs of all but said first and last flash tank means,

third conduit means for coupling said organic liquid portions from said last flash tank means for flow into said second heat exchanger means, and

condenser means coupled to the last of said turbine motor stages for supplying condensed organic liquid to said second heat exchanger means.

3,908,382

METHOD AND APPARATUS FOR CONVERTING LIQUID SHOCK WAVES INTO ROTARY MOTION

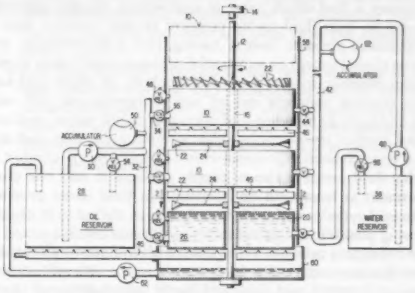
Wayne B. Stone, Jr., 7307 Nevis Rd., Bethesda, Md. 20034

Filed July 19, 1973, Ser. No. 380,695

Int. Cl. F01k *25/06*

U.S. Cl. 60—649 **10 Claims**

1. A method of converting liquid shock waves into rotary motion, comprising; containing a body of liquid in communication with extrusion orifice means opening to a gaseous environment externally of the contained liquid; generating a shock wave within said liquid and expressing a stream consisting of said liquid and comprising a small fraction of said body of liquid through said orifice means into said gaseous environment and into driving impingement with rotary motion con-



version means; and repeating the aforesaid steps to produce sustained rotary motion.

3,908,383

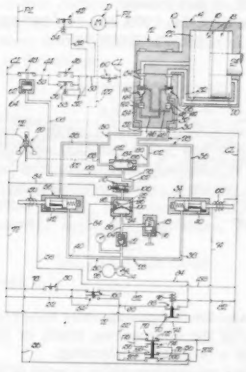
ROTARY CHUCK INSTALLATION OF FLUID-ACTUATED TYPE

Boynton Selden, West Hartford, Conn., assignor to Cushman Industries, Incorporated, Hartford, Conn.

Filed Sept. 24, 1974, Ser. No. 508,877

Int. Cl.[2] B23B *5/22*, *31/30*; **F01B** *21/04*

U.S. Cl. 60—698 **14 Claims**



1. Safe work grip mechanism for a rotary chuck having a power drive with a manual start control operative on manipulation to start the power drive, and companion fixed and rotary coupling members having a port in the fixed member, a cylinder in the rotary member with a piston defining in the cylinder a chuck-closing end and being shiftable into chuck-closing and chuck-opening positions, and a first passage from said port to said cylinder end, said mechanism comprising first means, including a first plunger, associated with said start control and normally conditioning said control for operation on manipulation of the latter, but acting on subjection of said plunger to fluid pressure to render said control inoperative; a first main conduit between said port and a fluid pressure supply source; a first main valve interposed in said conduit and dividing the latter into first and second sections, of which said first section leads to said port and forms together with said first passage a second passage from said main valve to said cylinder end, with said valve being normally urged into a first

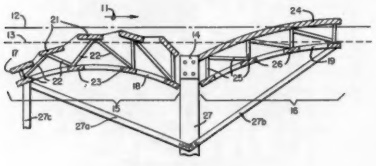
position in which to interrupt communication between said sections and vent said first section, and shiftable into a second position in which to provide communication between said sections; a first check valve in said second passage normally closed to trap fluid under pressure in said cylinder end; a differential-pressure switch having two compartments and being closed except on substantial pressure equilibrium in said compartments; second and third conduits, of which said second conduit connects one of said compartments with said second passage between said main and check valves, and said third conduit connects the other compartment with said second conduit section; a constriction in said second conduit to delay fluid pressure rise to supply pressure in said one compartment at least until on admission of fluid under pressure into said cylinder end said piston has been shifted to its chuck-closing position and in the latter position is also subjected to the full supply pressure of the fluid, with said plunger being for fluid pressure subjection in communication with said second passage between said main and check valves; a second check valve in said third conduit normally closed to trap fluid under pressure in said other compartment at the supply pressure; a main relay adapted, when energized, to shift said main valve into said second position; and control circuitry for said main relay, including said main relay, a manual start switch and said differential-pressure switch, with said circuitry being closed on closure of said start switch when said differential-pressure switch is closed, and being opened on opening of said differential-pressure switch when said start switch is open.

3,908,384

BREAKWATERS FOR LONG, SHORT AND/OR COMPLEX WATER WAVES

Kurt P. H. Frey, Newark, Del., assignor to Sigrid F. Balekjian, Arcadia, Calif., a part interest

Filed Sept. 14, 1973, Ser. No. 397,535
Int. Cl.[2] E02B *3/06*
U.S. Cl. 61—4 **10 Claims**



1. A breakwater for dampening water waves having a front part that receives the approaching crests of the oncoming water waves and a rear part, comprising:

first breakwater means comprising a series of discrete wave deflecting elements spaced at different locations along and normal to the direction of travel of the crests of the principal waves and at least at two depths and positioned to direct at least some of the water that passes under at least one element and over at least one other element, to produce vortices adjacent the elements and dampen the waves passing the elements,

second breakwater means, for dampening water waves, and which is a substantially continuous breakwater that has its leading end below water level and extends upwardly and rearwardly for a substantial distance,

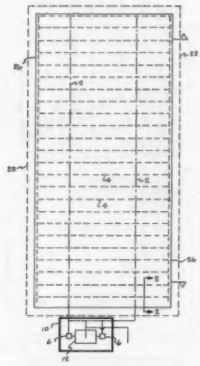
supporting means for, and operatively coordinating, said first and second breakwater means, said supporting means positioning the first breakwater means ahead of the second breakwater means and with the rear end of the first breakwater means within a distance of the front end of the second breakwater means not greater than the combined chord lengths of the first and second breakwater means so that the first and second breakwater means cooperate with each other to provide dampening of a wider range of wavesteepnesses than either breakwater means alone provides.

3,908,385

PLANTED SURFACE CONDITIONING SYSTEM

William H. Daniel, and Melvin J. Robey, both of West Lafayette, Ind., assignors to Purdue Research Foundation, Lafayette, Ind.

Continuation-in-part of Ser. No. 263,434, June 16, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 435,691
Int. Cl.[2] E02B *11/00, 13/00*
U.S. Cl. 61—11 **2 Claims**



1. A drainage system for rapid drainage of the top surface of an athletic playing field and for water conservation, characterized by: a compacted subsoil base; a waterproof barrier disposed above said subsoil; a drainage pipe system disposed above said waterproof barrier; a porous medium composed substantially completely of sand having an effective grain size in the range from 0.125 mm to 0.5 mm surrounding said drainage pipe system and disposed thereabove to a proposed final field grade level; a rooting medium comprised of substantially non-compactible materials composed of a mixture of peat, vermiculite and calcined aggregate, incorporated into the uppermost 1 to 2 inch portion of said porous medium; a vegetative cover crop rooted in the mixture of said rooting medium and said porous medium; and a vacuum pump operatively connected to said drainage pipe system to create a suction pressure of at least four inches Hg to provide suction at said surface whereby water upon said vegetative cover crop is continuously drawn down from the top surface thereof through said porous medium and into said drainage system so that substantially said entire top surface above said porous medium is rapidly drained of water thereon.

3,908,386

ROCK BOLT FOR REMOTE INSTALLATION

Chester I. Williams, 347 Greenbriar, S.E., Grand Rapids, Mich. 49506

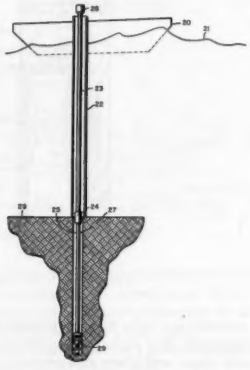
Continuation of Ser. No. 60,427, Aug. 3, 1970, abandoned. This application Apr. 25, 1972, Ser. No. 247,396
Int. Cl.[2] E21D *20/02*
U.S. Cl. 61—35 **3 Claims**

1. A method of setting a rotatively-set rock bolt in a hole in a ground formation from a remote position, said method comprising:

inserting a rock bolt assembly in said hold, said assembly including a bolt rod threaded at the opposite ends thereof, and an anchor device including a cone member in threaded engagement with one of said bolt rod ends, an

expansible shell member at least partially surrounding said cone member, and means limiting the axial movement of said shell with respect to said bolt rod;

rotating said bolt rod with an extended torque rod having a coupling in threaded engagement with the other of said bolt rod ends, said rotating continuing to the extent of setting said anchor device; and



back-rotating said torque rod to disconnect said coupling, said back-rotating being accompanied by limiting the back-rotation of said bolt rod with respect to said cone member by interengaging said cone member and means secured to said bolt rod.

3,908,387

APPARATUS FOR SOLIDIFYING AND IMPROVING FRAGILE GROUND

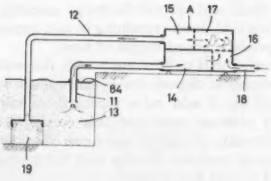
Masakuni Nakamura, Nishinomiya, Japan, assignor to Fudo Kensetsu Kabushiki Kaisha, Osaka, Japan

Filed Nov. 27, 1973, Ser. No. 419,281

Claims priority, application Japan, Jan. 13, 1973, 48-6773

Int. Cl.² E02D *3/12*

U.S. Cl. 61—36 **3 Claims**



1. An apparatus for treating, improving and solidifying unimproved soils by the addition of a stabilizer to the unimproved soil, said apparatus comprising:

removal means for removing the unimproved soil from its location for treatment, said removal means comprised of a suction means and a removable pipeline running from the unimproved soil location and connected to said suction means;

stabilizer supply means for supplying the stabilizer necessary to treat said unimproved soil removed by said removal means;

mixing means connected to said removal means and to said stabilizer supply means for mixing said unimproved soil with said stabilizer, thereby forming improved soil;

pressure feeding means connected to said mixing means for returning said improved soil to below the surface of the unimproved soil from which it was drawn, said pressure feeding means comprised of a pumping means and a distributing pipeline connected to said pumping means for carrying said improved soil away from the apparatus; and

a slide panel slidably mounted on said removal means where said pipeline contacts said unimproved soil for moving downwardly along said pipeline and for applying downward pressure to the unimproved soil surrounding the removal pipeline as the unimproved soil is removed by the removal means.

3,908,388

PROCESS FOR SOIL STABILIZATION

Frederick William DeVries, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 17, 1974, Ser. No. 461,732

Int. Cl.² E02D *3/12, 3/14;* **E21B** *33/138*

U.S. Cl. 61—36 R **10 Claims**

1. An improved method for treating soil which comprises contacting the soil with a slurry of highly absorbent, low bulk density, hydrated alkali metal silicate in a non-aqueous fluid and reacting an alkali metal acid phosphate or an amide of the formula

wherein R is hydrogen, an alkyl group having one to four carbon atoms, an alkoxy group having one to four carbon atoms, or $-CONX_2$ wherein X is hydrogen or an alkyl group having one to four carbon atoms and from 0 to 80% of the equivalent amount of a reactive salt with the silicate in the presence of from 0.8 to 2.5 moles of water per mole of alkali metal oxide in the silicate.

3,908,389

MINE ROOF SUPPORT

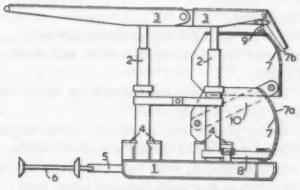
Walter Lubojatsky, Recklinghausen, and Wilhelm Wertelewski, Datteln, both of Germany, assignors to Becorit Grubenausbau GmbH, Recklinghausen, Germany

Filed Jan. 11, 1974, Ser. No. 441,485

Claims priority, application Germany, Feb. 27, 1973, 2309670

Int. Cl.² E21D *15/44*

U.S. Cl. 61—45 D **5 Claims**



1. A mine roof support, for use at a mineral face, comprising a base member, extensible prop means mounted on said base member, a roof-engaging structure mounted on said prop means for application thereby to a roof to be supported, a multi-part flushing screen shield including upper and lower parts arranged on the goaf side of the support, first hinge means mutually connecting the parts of said screening shield and having their axes lying in the longitudinal direction of the mineral face, a flexible member connecting the upper part of the shield and the roof-engaging structure and which permits movements of the upper part of the shield about an axis lying transversely to the longitudinal direction of the mineral face,

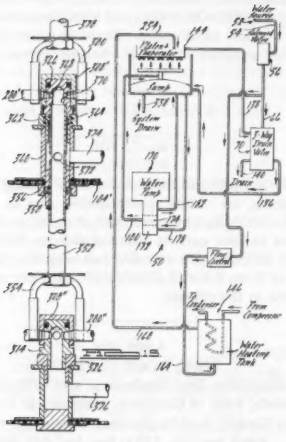
and second hinge means connecting the lower part of the shield with the base member and having a hinge axis which lies transversely to the longitudinal direction of the mineral face, whereby the screening shield is pivotally movable with respect to the support not only toward and away from the mineral face but also parallel thereto.

3,908,390

ICE MAKING MACHINE

George Dickson, and Robert K. Westergaard, both of Alden, Minn., assignors to King-Seeley Thermos Co., Ann Arbor, Mich.

Division of Ser. No. 190,234, Oct. 18, 1971, Pat. No. 3,791,163. This application Aug. 20, 1973, Ser. No. 389,577
Int. Cl.² F25C 5/08
U.S. Cl. 62—73 **24 Claims**



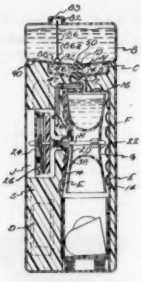
11. An ice making machine comprising,
a refrigeration system,
an ice forming mold,
a water system including a water sump adapted to contain make-up water for ice to be frozen in said mold during a freezing cycle,
means for communicating said make-up water from said water sump toward said mold,
a thawing water platen for retaining water adjacent the upper ends of said mold during a harvest cycle,
means for communicating thawing water from said platen to said water sump so that said thawing water may constitute the ice make-up water for the next successive freezing cycle,
means in addition to said last mentioned means for communicating a predeterminately greater quantity of water to said sump preparatory to each freezing cycle than is needed for said make-up water so that a small amount of excess water may be communicated away from the machine during each cycle thereof in order to prevent the accumulation of foreign material in said water system, and
means for continuously operating said means for communicating make-up water from said sump toward said mold during both said freezing cycle and said harvest cycle.

3,908,391

PORTABLE ICE CUBE MAKER

William L. Wulke, 1313 N. Thornburg, and Reinhart J. Rabska, 917 Haslam Dr., both of Santa Maria, Calif. 93454

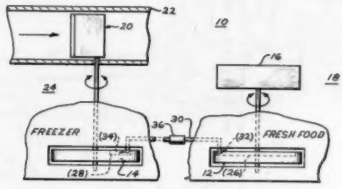
Filed Nov. 7, 1974, Ser. No. 521,640
Int. Cl.² F25C 1/10
U.S. Cl. 62—137 **5 Claims**



1. A portable ice cube making machine that includes:
a. an assembly that includes a vertically extending housing having upper and lower end portions, a water reservoir in said upper portion, a water metering tank in said housing below said reservoir, said reservoir and metering tank having first and second water discharge openings therein through which water may flow by gravity;
b. movable valve means capable of occupying either first or second positions, said valve means when in said first position obstructing said second discharge opening and permitting water to flow into said metering tank to fill the latter, and said valve means when in said second position obstructing said first opening and permitting to flow downwardly from said metering tank through said second discharge opening;
c. a vertically extending drum rotatably supported in said housing below said second discharge opening, said drum having a plurality of circumferentially extending cups thereon that have inwardly tapering sidewalls;
d. an electric motor;
e. drive means actuated by said motor for intermittently rotating said drum to sequentially dispose said cups in an uppermost position to receive a metering quantity of water from said second discharge opening and said cup receiving said water remaining in said uppermost position for a predetermined length of time;
f. first means that concurrently with the actuation of said drive means to dispose one of said cups in said uppermost position move said valve means from said first to said second position, and said first means as said drum is intermittently rotated to move one of said cups from said uppermost position moving said valve means from said second to said first position;
h. refrigeration means that cool said drum to the extent that a crust of ice forms on said water in said one of said cups in said uppermost position during said predetermined length of time, with said water having said crust thereon being frozen solid to define an ice cube prior to said cup in which it is disposed being rotated by said drum to occupy a lower most position thereon, and said ice cube falling from said cup when the latter is in said lowermost position due to the expansion of the water as it transforms to ice in contact with said tapered sidewalls of said cup;
i. second removable means in said housing for receiving said ice cubes as they fall from said cups when the latter are in said lowermost position;
j. third means for temporarily terminating operation of the device when a predetermined weight of ice cubes has

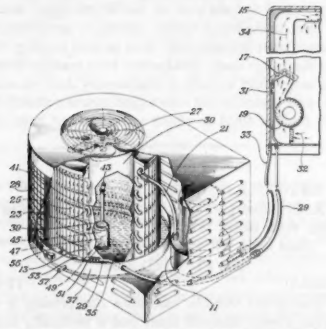
accumulated in said second removable means; and
k. a source of electric power for said electric motor.

3,908,392
DUAL CONTROL COORDINATING APPARATUS FOR A REFRIGERATOR
Frank A. Schumacher, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Oct. 30, 1974, Ser. No. 519,054
Int. Cl.² F25D *17/00*
U.S. Cl. 62—180 **5 Claims**



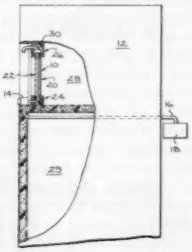
1. In a control system of a refrigerator-freezer having a first control wheel connected to a compressor motor control means and a second control wheel connected to an air flow control means, the improvement comprising:
each of said control wheels having a groove extending about the axis of said control wheel; and
an actuating element having first and second ends, said first end being positioned in the groove of the first wheel and said second end being positioned in the groove of the second wheel, said grooves having groove ends positioned relatively one to the other for preselected movement of one wheel and its associated control means in response to movement of the actuating element by the other wheel and its associated control means.

3,908,393
AIR CONDITIONING UNIT CONTAINING CONDENSER WITH EVAPORATIVE SUB-COOLER
Marcus P. Eubank, Box 7576, Longview, Tex. 75601
Filed Jan. 2, 1975, Ser. No. 538,105
Int. Cl.² F28D *5/00*
U.S. Cl. 62—305 **8 Claims**



1. In a combination for supplying conditioned air to an enclosure, the combination including:
an air conditioning unit having a closed system with a refrigerant contained therein and including: a compressor for compressing the refrigerant gas, a condenser coil connected with said compressor for condensing the compressed refrigerant, a condenser fan for circulating ambient air past said condenser coil in heat exchange relationship with said compressed refrigerant, an evaporator coil connected with said condenser coil for evaporating the liquefied refrigerant in heat exchange relationship with air circulated therepast to be conditioned, and an evaporator fan for circulating said air to be conditioned past said evaporator coil, the improvement comprising:
a basin for submerging within water a selected number of lower coils of said condenser coil, said lower coils containing exiting refrigerant;
water in said basin; said refrigerant in said condenser being cooled by the ambient air prior to being cooled by the water in said basim;
liquid levelling means in communication with the water of said basin for maintaining a predetermined water level at a depth which submerges a selected number of lower condenser coils;
pumping means in communication with said water of said basin for pumping said water;
a conduit attached to said pumping means provided with an open upper end and extending upwardly, terminating at a point within the stream of air circulated by said fan after passage through said condenser coil;
whereby water circulated by said pumping means will discharge through said conduit and tend to evaporate as hot air drawn by said condenser fan passes over said discharge.

3,908,394
WATER-DISPENSING SYSTEM
Dwight W. Jacobus, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Nov. 14, 1974, Ser. No. 523,694
Int. Cl.² F25D *23/12*
U.S. Cl. 62—339 **6 Claims**

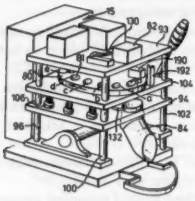


1. In a water-dispensing system of a household refrigerator having a valve and an inlet connected to a pressurized water-supply source for controllably passing chilled water through and from the refrigerator, the improvement comprising:
a freezing tank having movable walls defining a chamber open at the ends and being positioned in the water-dispensing system downstream of the valve and at a location within the refrigerator at which only a middle portion of the tank is maintained at a temperature less than 32°F for forming ice in said chamber with said walls being movable in response to opening the valve for passing water over the ice.

3,908,395
DEVICE FOR DISPENSING ICE
Alan James Hobbs, Hobic House, Schoolfield Rd., West Thurrock, Grays, Essex, England
Filed Feb. 9, 1973, Ser. No. 331,096
Claims priority, application United Kingdom, Feb. 17, 1972, 7432/72; May 11, 1972, 22170/72; July 14, 1972, 33035.
Int. Cl.² F25C *1/10*
U.S. Cl. 62—346 **17 Claims**

1. A device for dispensing ice comprising a refrigeration unit including a container forming an evaporator and comprising an annular drum having inlet and outlet openings for a

fluid refrigerant, a plurality of moulds arranged around the axis of the drum, at least a part of the internal surface of each mould being formed by a portion of an external surface of a wall of the container, means for ejecting a piece of ice from



one of said plurality of moulds, means for indexing the drum to bring each mould in turn into alignment with the ejecting means and subsequently into alignment with means for supplying liquid to be frozen thereto.

3,908,396

DIRECT CYCLE HEATING, COOLING AND REFRIGERATING APPARATUS

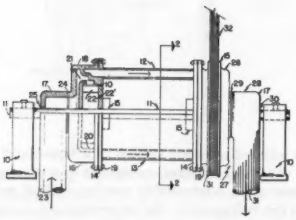
Lynne E. Windsor, Winnipeg, Canada, assignor to James B. Carter Limited, Winnipeg, Canada

Filed June 18, 1974, Ser. No. 480,586

Claims priority, application United Kingdom, June 20, 1973, 29199/73

Int. Cl.[2] F25D *9/00*

U.S. Cl. 62—402 **6 Claims**



1. A direct cycle heating, cooling and refrigerating unit for fluids driven by an associated source of power and comprising in combination spaced apart support means, a stationary shaft extending between said support means, a rotary heat exchanger journalled for rotation upon said shaft and operatively connected to said source of power, a fluid pump secured to one end of said rotary heat exchanger and being operatively connected thereto, fluid inlet means operatively connected to said pump, a fluid expander portion operatively secured to the other end of said rotary heat exchanger and a fluid outlet operatively connected to said expander portion, said rotary heat exchanger including a pair of spaced and parallel header flanges, a plurality of hollow fluid conveying elements extending between said header flanges thus constituting a squirrel cage type heat exchanger, said hollow elements being operatively connected by one end thereof to said fluid pump and by the other end thereof to said expander portion.

3,908,397

COOLING SYSTEM

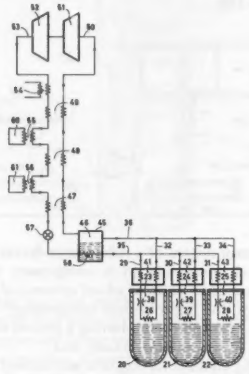
Gijsbert Prast, and Jan Mulder, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,399

Claims priority, application Netherlands, Apr. 9, 1973, 7304884

Int. Cl.[2] F25B *19/00*

U.S. Cl. 62—514 **7 Claims**



1. In a cooling system operable with a source of cooled fluid for refrigerating a closed space, including a cooling element which is situated in said space and through which said fluid is flowable for refrigerating said space, a supply duct for communicating said fluid from said source to said cooling element, a discharge duct for communicating said fluid from said element to said source, and means for circulating said fluid through said system, the improvement in combination therewith, wherein said supply and discharge ducts each comprise a first part extending from said source to said closed space and a second part within said closed space extending to said cooling element, said first part of said supply and discharge ducts having adjacent portions in heat exchange relationship forming a heat exchanger, the improvement being a blocking device comprising said heat exchanger and a fluid flow restriction means in said second part of the supply duct, whereby a heat leak into said closed space causing a temperature rise therein causes heat transfer into fluid in said cooling element and in said discharge duct, and further heat transfer from fluid in said discharge duct to fluid in said supply duct via said heat exchanger, and wherein said restriction means restricts flow in said supply duct of fluid to which said heat has been added.

3,908,398

ARTICULATED VEHICLE ASSEMBLY

Benjamin A. Braunberger, West Bend, Wis., assignor to GEHL Company, West Bend, Wis.

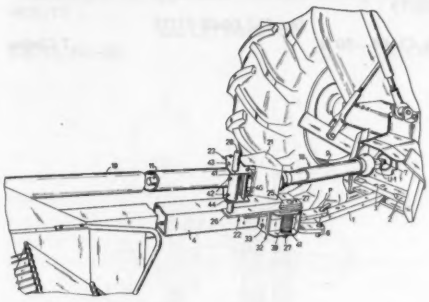
Filed Mar. 29, 1974, Ser. No. 456,248

Int. Cl.[2] F16D *3/00*

U.S. Cl. 64—6 **11 Claims**

1. An articulated vehicle assembly comprising a tractor having a rear power take-off shaft and a vertically and horizontally fixed drawbar projecting rearwardly beyond said power take-off shaft; a trailing implement having a vertically and horizontally fixed, forwardly projecting draft tongue, hitch means connecting said implement draft tongue to said tractor drawbar on a pivot center at a fixed rearward spacing from the rear end of said power take-off shaft; a forwardly extending drive shaft on said trailing implement having a forward end spaced rearwardly from said pivot center a greater distance than said rearward spacing of the latter from

said power take-off shaft; an extension shaft universally pivoted at one end thereof to said implement drive shaft; a torque transmitting telescopic shaft assembly universally pivoted at one end to said power take-off shaft and at its other end to the other end of said extension shaft; and guide means for said



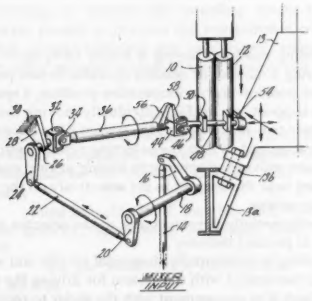
other end of said extension shaft operatively mounted on said draft tongue whereby said extension shaft is sustained on said implement in horizontally back and forth swingable relation thereto about its pivot connection with said implement drive shaft.

3,908,399

PRIMARY FLIGHT CONTROL WITH ISOLATED GEAR BOX

Ronald Arthur Durno, Trumbull, and James Clement Dean, Stratford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 23, 1973, Ser. No. 353,924
Int. Cl. F16d *3/26*
U.S. Cl. 64—17 R **2 Claims**



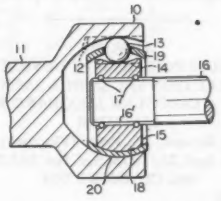
1. In a helicopter, a rigid framework, a main rotor gear box, resilient mounts for supporting said gear box on said framework with freedom for vibratory movement in all planes, main rotor servos rigidly mounted on said gear box including a torsional servo-operating shaft, a pilot operative torsional shaft rigidly mounted on said framework which is operatively connected to manual controls in the pilot's compartment, and means for maintaining the pilot's controls free from movement due to vibrations of said gear box due to flight forces on the rotor blades including a rigid load-carrying torsion coupling connecting said servo-operating shaft and said pilot operative shaft, said coupling including an intermediate tubular torsional shaft, a first universal joint connecting said pilot operative torsional shaft and said intermediate torsional shaft, a second universal joint having one of its halves connected to said servo-operating shaft and its other half connected to a shaft which telescopes within said intermediate torsional shaft, nylon bearings between the telescoping surfaces of said telescoping shafts, and scissor mechanism torsionally connecting said intermediate torsional shaft and said other half of said second universal joint, said scissors mechanism comprising the sole torsional connection between said telescoping shafts.

3,908,400

CONSTANT VELOCITY UNIVERSAL JOINT

Koichi Takahashi, Yokohama; Nobuteru Hitomi, Yokosuka, and Taisuke Kizu, Fujisawa, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Mar. 28, 1974, Ser. No. 455,800
Claims priority, application Japan, Mar. 29, 1973, 48-35955
Int. Cl.² F16D *3/30*
U.S. Cl. 64—21 **5 Claims**



1. A constant velocity universal joint comprising a shaft, an outer and an inner member whose axes intersect at variable angles and mounted concentrically with and axially surrounding said shaft, said inner member being supported on and connected to said shaft, a plurality of lands located on said outer and inner members for forming a plurality of equidistantly circularly spaced, intersecting outer and inner part-helical ball race grooves respectively, the outer ball race groove being parallel to a first helix wound in one direction of rotation about the axis of said outer member and the inner ball race groove being parallel to a second helix wound in the opposite direction of rotation about the axis of said inner member so that said first and second helixes intersect at various points, a plurality of power transmitting balls movably engaging the corresponding grooves of said outer and inner members for transmitting torque from one of said members to the other of said members, and a ball locating cage mounted intermediate the outer and inner members for locating said balls with their center points on a common plane which bisects the obtuse angle formed by the axes of said members and having an outer and an inner spherical surface for pivotally engaging the lands on said inner and outer members, respectively.

3,908,401

TORSIONALLY AND/OR AXIAL SOFT COUPLING

Alfred B. Harbage, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 20, 1974, Ser. No. 481,007
Int. Cl.² F16D *3/14*
U.S. Cl. 64—27 NM **7 Claims**

1. A soft shaft coupling for use in a marine propeller shaft comprising:

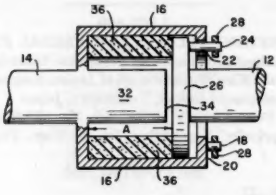
a cup-shaped side attached to the driven shaft;

a plunger-shaped side coupled with said cup-shaped side and attached to the driving shaft;

a pin and link arrangement hard coupling said sides together torsionally; and

a deformable dense mass activated by centrifugal force, soft coupling said sides together axially and contained with

said cup shaped side, whereby the propeller thrust tending to close the coupling is equal and opposite to the force



of the dense mass acted on by rotationally induced force, tending to separate the coupling at all rotational speeds.

3,908,402

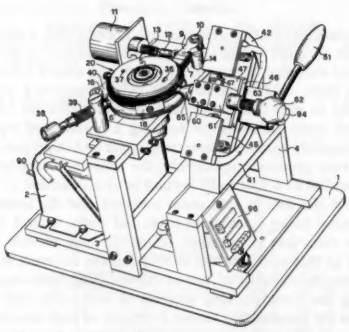
PROGRAMMED POSITIONING DEVICE FOR THE NEEDLE SELECTION JACKS IN A JACK SUPPORT WHEEL OF A CIRCULAR JACQUARD KNITTING MACHINE

Dino Meoni, Via Ricasoli, 25, Prato (Florence), Italy

Filed Apr. 23, 1973, Ser. No. 353,737

Int. Cl.[2] D04B *37/04*

U.S. Cl. 66—1 R **9 Claims**



1. A programmed positioning device for the needle selection jacks in a jack support wheel of a circular jacquard knitting machine of the type provided with a plurality of equidistant radial slots in each of which is housed in a radially slidable manner a pair of superimposed jacks movable between a first position in which the outer ends of the jacks are both substantially in line with the external profile of the wheel, a second position in which a first jack is withdrawn with respect to a second jack and a third position in which both jacks are withdrawn with respect to the first stated position, characterised in that said programmed positioning device comprises a support frame for the wheel, means for producing angular stepwise forward movements of the wheel in such a manner that each of the radial slots of the wheel is brought successively into a predetermined position in which it is momentarily halted, thrust means slidably supported by said support frame in a position aligned with a slot as it comes in turn into said predetermined position, means for setting the thrust means to selectively move one or both of the jacks, and means for imparting axial movement to said thrust means whereby said thrust means is inserted radially into said slot and engage either with both the jacks housed in the slot, or selectively, only with said first jack, so as to move the jacks from the first to the third or to the second of the aforementioned positions respectively.

3,908,403

KNITTING MACHINE

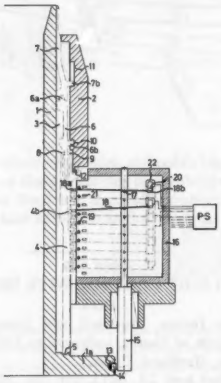
Anthony S. Ringrose, Geneva, Switzerland, assignor to Battelle Memorial Institute, Geneva, Switzerland

Filed Feb. 26, 1974, Ser. No. 445,863

Claims priority, application Switzerland, Feb. 28, 1973, 2892/73

Int. Cl.[2] D04B *15/78*

U.S. Cl. 66—50 R **7 Claims**



1. A knitting machine having a frame carrying a moving support having a number of needles operable to two positions, an operative position and an inoperative position, a system for driving the support, means for individually moving the needle between their two positions, and a system for selecting such means characterized in that the selecting system comprises:

at least one moving selector arm having at one end a cam disposed near the support to act selectively on the needle-moving means;

a slider substantially perpendicular to the selector arm and which is pivoted thereto;

a cam having a substantially sinusoidal profile and which is solid in movement with the system for driving the support and which is in engagement with the slider to reciprocate the same between two positions, the cycle of such reciprocation corresponding to the consecutive passage past a fixed point of two needles controlled by the selector arm;

two abutments which are simultaneously adjacent the selector arm in one of its two end positions defined by the slider, and

means for continuously applying to the arm a first and predetermined force towards one of the abutments when the same makes contact with the selector arm, and means for selectively applying to the selector arm a second force which is greater than the first force and which is operative towards the outer of the abutments when the arm contacts such other abutment, so that the selector arm pivots while bearing on one or other of the abutments according as the second force is or is not applied, causing the cam which is rigidly connected to the selector arm to make a movement proportional to the length of lever arm chosen.

3,908,404

HAND-OPERATED KNITTING MACHINE

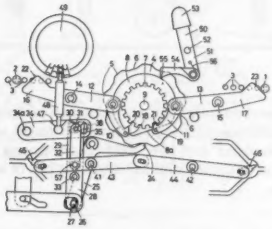
Heinz Zullig, Wettingen, Switzerland, assignor to MADAG Maschinen-und Apparatebau Dietikon AG, Dietikon, Switzerland

Filed Apr. 1, 1974, Ser. No. 456,460

Claims priority, application Switzerland, May 15, 1973, 6876/73

Int. Cl.² D04B 7/00

U.S. Cl. 66—60 5 Claims



1. A hand-operated knitting machine, comprising a plurality of needles having butts, a needle bed, control means mounted on said needle bed, needle-butt switches cooperating with the butts of said needles, a carriage reciprocatingly displaceable relative to said needle bed, a pattern device secured to said carriage, a switch-actuating member for the needle-butt switches, a transmission rod assembly, said switching-actuating member operatively connecting said pattern device to said transmission rod assembly, said transmission rod assembly being operatively connected with said switches to effect transmission of motion from said actuating member to said switches, coupling means disposed between said actuating member and said transmission rod assembly for selectively coupling said actuating member to or uncoupling said actuating member from said transmission rod assembly, said control means serving to actuate said coupling means in order to respectively permit or prevent the transmission of motion as a function of said coupling and uncoupling, respectively, of said actuating member with said transmission rod assembly.

3,908,405

NEEDLE CLAMP FOR STRAIGHT KNITTING MACHINES

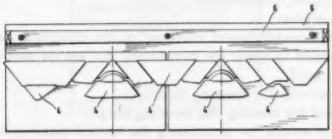
Hans Schieber, Bopfingen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed July 25, 1974, Ser. No. 491,707

Claims priority, application Germany, July 27, 1973, 2338274

Int. Cl.² B04D 7/00, 15/36, 35/00

U.S. Cl. 66—78 3 Claims



1. A straight knitting machine comprising at least one needle board having a plurality of needle channels, a plurality of needles displaceably mounted in said channels, an elongated sliding carriage mounted in said machine for movement relative to said needle board along the length thereof, a clamping bar, means for flexibly mounting said clamping bar on said sliding carriage lengthwise thereof in normally closely spaced proximity to said needles.

3,908,406

APPARATUS FOR CONTROLLING THE PROGRAMMING CHAIN OF A CIRCULAR KNITTING MACHINE

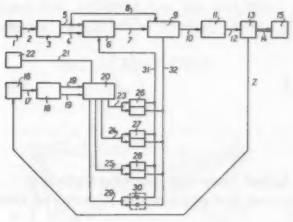
Josef Maler; Jaroslav Lorenc, and Ivo Kouklik, all of Trebic, Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi generalni veditelstvi, Liberec, Czechoslovakia

Filed Mar. 20, 1973, Ser. No. 342,985

Claims priority, application Czechoslovakia, Mar. 20, 1972, 1844-72

Int. Cl.² D04B 15/00

U.S. Cl. 66—155 7 Claims

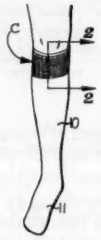


1. A circular knitting machine comprising a needle cylinder rotating in a plural number of revolutions and associated knitting instruments, a control drum adapted to index about a central axis containing a plural number of sections having programming means for causing operation of said needle cylinder and selective knitting instruments to provide a knitwork having several different sections, a chain, means responsive to a pre-determined number of rotations of said needle cylinder for intermittantly advancing said chain, and means responsive to the advancement of said chain for selectively allowing said control drum to index from section to section in response to a predetermined number of intermittant advancements of said chain, stop means for mechanically preventing normal advancement of said chain, a first control circuit having a stored program determined with respect to the number of intermittent movements of said chain required to index said control drum from section to section, the number of sections of said knitwork requiring change in selection of said instruments and the number of revolutions of said needle cylinder, a second control circuit for processing said program relative to the actual rotation of said needle cylinder, said second circuit producing a signal actuating said stop means to prevent advancement of said chain for an interval in accordance with the stored program, and feedback means responsive to the operation of said stop means for synchronizing the operation of said first and second circuits, said first control circuit comprising a pulse generator producing a driving pulse, a plurality of switch circuits, and a counter having separate memory units each of which are connected to a switch circuit, said switch circuits being collectively connected to the second control circuit, said second control circuit comprising a scanner for sensing the number of revolutions of said needle cylinder, a pulse generator, a low order counter and a high order counter, said switch circuits of said first circuit being connected to the low and high order counters respectively, an amplifier connected to the output of said low and high counters the output of which being connected to the means for allowing the control drum to index.

3,908,407
LADIES' KNEE-HIGH STOCKING WITH SUPPORTING CUFF

Abel L. Brand, Westport, Conn., and Robert L. Hubbard, Henderson, N.C., assignors to Americal Corporation, Henderson, N.C.

Filed Oct. 2, 1974, Ser. No. 511,317
Int. Cl.[2] D04B 9/46
U.S. Cl. 66—172 E 14 Claims



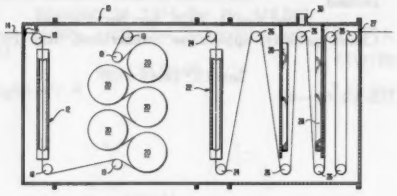
12. A ladies' knee-high stocking including
a. a leg and foot portion knit of textured stretchable yarn, and
b. a relatively wide cuff for supporting the upper end of the stocking on the leg of the wearer, said supporting cuff including the same number of wales as said leg and foot portion and comprising
1. a relatively narrow inwardly turned welt at the upper end thereof, and
2. a single-ply portion comprising successive coursewise extending bands extending throughout the width of said single-ply portion of said cuff, each of said bands including
A. a single course of plain knit stitches knit exclusively of spandex yarn, and
B. at least three successive courses of stitch loops knit of stretchable body yarn, said single courses of spandex yarn being knit under sufficient tension that the stitch loops formed thereof straighten out in the relaxed fabric and draw the stitches of said body yarn in adjacent courses around the straightened out stitches of spandex yarn to form spaced apart inwardly extending ribs on the inner surface of said single-ply portion of said cuff to aid in supporting the same on the leg of the wearer.

3,908,408
APPARATUS FOR THE CONTINUOUS TREATMENT OF AN ADVANCING WEB

Nelson F. Getchell, Great Falls, Va.; Norman R. S. Hollies, Bethesda, and Samuel S. Stanton, Chevy Chase, both of Md., assignors to Cotton Incorporated, New York, N.Y.

Filed Feb. 2, 1973, Ser. No. 329,145
Int. Cl. D06c 1/10
U.S. Cl. 68—5 E 9 Claims

1. Fluid treatment apparatus comprising:
enclosure means;
first and second reaction chamber means in said enclosure means for applying fluid to a continuous web of material being conducted longitudinally therethrough, said reaction chambers including longitudinally aligned entrance and exit openings and means at the entrance and exit openings for preventing significant leakage of the fluid from said chamber into said enclosure means, whereby fluid is substantially confined within said reaction chamber means, each said reaction chamber being spaced from the top and botton of said enclosure means;
a plurality of rotary drums in said enclosure means between said first and second reaction chambers; and

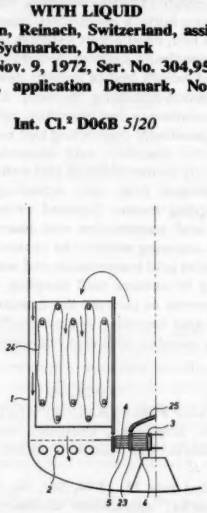


means for conducting a continuous web of material into said enclosure means and in sequence through said first reaction chamber and over said rotary drums and through reaction chamber, and subsequently out of said enclosure means.

3,908,409
APPARATUS FOR THE TREATMENT OF TEXTILES WITH LIQUID

Hans Børge Nielsen, Reinach, Switzerland, assignor to Vald. Henriksen A/S, Sydmarken, Denmark

Filed Nov. 9, 1972, Ser. No. 304,953
Claims priority, application Denmark, Nov. 17, 1971, 5645/71
Int. Cl.[2] D06B 5/20
U.S. Cl. 68—15 3 Claims



1. Apparatus for treating textile material with heated treatment liquid, comprising:
a container;
a replaceable insert received in the container and having means thereon for supporting the textile material to be treated.
a reservoir for treating liquid;
means for heating the treating liquid;
pump means for circulating the heated treating liquid from the reservoir to the container for contact with the textile material;
divider means between the pumping means and container which may be disposed to divide the heated treating liquid into two differently directed flows;
the pump means being constituted by a propeller-type pump having a propeller means provided with two distinct sets of rotated blades having said divider means disposed between them.

3,908,410
APPARATUS FOR THE TREATMENT OF TEXTILE FIBERS AND FABRICS

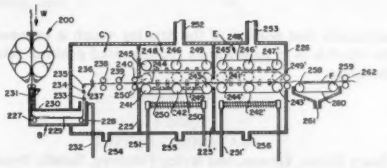
Ryo Umehara, and Fujio Bekku, both of Ichinomiya, Japan, assignors to I.W.S. Nominee Company Limited, London, England

Continuation-in-part of Ser. No. 253,797, May 16, 1972, Pat. No. 3,849,848. This application Jan. 21, 1974, Ser. No. 435,013

Claims priority, application Japan, Jan. 26, 1973, 48-10395

Int. Cl.[2] D01H 5/18

U.S. Cl. 68—20 1 Claim



1. Apparatus for crimping protein fibers comprising in combination:

means for impregnating said fibers with an aqueous solution containing an alcohol;

means for storing said impregnated fibers to allow penetration of said solution;

means for drafting said fibers; and

means for setting and drying said fibers; said apparatus further comprising a setting chamber and a drying chamber each provided with means for forwarding said fibers; and

said setting chamber and said drying chamber are each provided with a pair of belts for forwarding said fibers, each pair of belts being adapted to be urged together to maintain said drafting forces on said fibers.

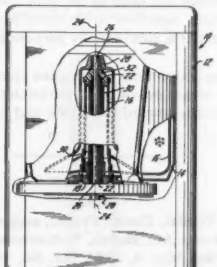
3,908,411
UNITIZED WASHING MACHINE BUSHING

Michael E. Fahmie, 440 Bella Vista, Brick Town, N.J. 08723

Filed June 6, 1973, Ser. No. 367,549

Int. Cl.[2] D06F 37/00

U.S. Cl. 68—23.7 12 Claims



1. An improved washing machine having a tub to receive washing fluid and clothes to be washed therein, said tub having a central axis, a center post having a first longitudinal axis supporting said tub about said central axis, a spin tube having a second longitudinal axis within said center post arranged with said first and second longitudinal axes coincident, said spin tube connected to said tub for driving thereof during extraction of said washing fluid, agitating means positioned within said tub for agitation of said clothes during the washing thereof, an agitator shaft having a third longitudinal axis within said spin tube arranged with said first and third longitudinal axes coincident, said agitator shaft connected to said agitator means for driving thereof during said agitation, wherein the improvement comprises

a bushing formed so as to provide predetermined spaced relationships between said center post and said spin tube and between said spin tube and said agitator shaft, and

said bushing having surfaces coacting with surfaces of said center post, said spin tube and said agitator shaft.

3,908,412
DEFLECTOR FOR THE DOOR OF A WASHING-MACHINE TUB

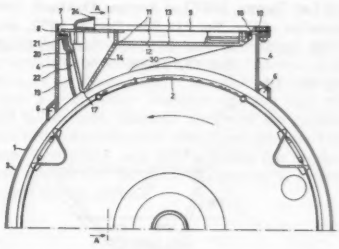
Philippe de Hedouville, Feuquieres en Vimeu, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1974, Ser. No. 441,974

Claims priority, application France, Feb. 19, 1973, 73.05798

Int. Cl.[2] D06F 37/18

U.S. Cl. 68—24 13 Claims



1. A door for a washing-machine tub, said door of the type closing a loading funnel of a tub of a washing-machine having a drum which rotates about an axis of a horizontal shaft, wherein the improvement comprises a deflector for said door, said deflector comprising a surface which faces the drum and is defined by a generatrix, lying in a plane that passes through and is rotated about the axis of rotation of the drum, a directrix of said generatrix lying in a plane which is median and perpendicular to said axis, said directrix having a distance from said axis which decreases in the direction of rotation of the drum during spin-drying, and means for supporting said surface from said door.

3,908,413
PRESSING APPARATUS FOR THE PRESSURE EXTRACTING OF LIQUID

Arnfried Meyer, Neckargartacherstrasse, 7101 Frankenbach, Germany

Filed Aug. 26, 1974, Ser. No. 500,694

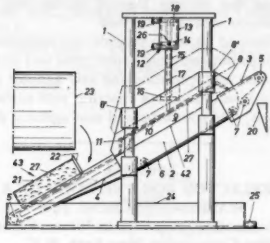
Claims priority, application Austria, Aug. 30, 1973, 7532/73

Int. Cl.[2] D06F 47/00; B30B 9/24, 5/02

U.S. Cl. 68—242 15 Claims

1. Pressing apparatus for the squeezing out of liquid from fibrous or granular material, especially for the wringing out of laundry, consisting of a diaphragm press with a pressure member, the pressure chamber of which is covered by a diaphragm, a pressure medium being introducible into this pressure member to deform the diaphragm, and with a liquid-permeable conveyor belt extended in parallel underneath the diaphragm and being supported by a supporting member, this conveyor belt being movable, with the material to be pressed lying thereon, from a loading station into the pressing station underneath the pressure member and from there into the unloading station, characterized in that a preforming device disposed at

the loading station is located upstream of the diaphragm press, and that the pressure member is adapted to be vertically



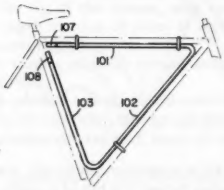
adjustable and is provided with a pressure chamber for receiving the laundry bale shaped in the preforming device.

3,908,414

BICYCLE LOCKING HARNESS

Stephen Lee Thorne, 2687 Las Aromas, Oakland, Calif. 94611

Continuation of Ser. No. 312,536, Dec. 6, 1972, abandoned.
This application Mar. 11, 1974, Ser. No. 449,867
Int. Cl.² E05B *73/00*
U.S. Cl. 70—18 **2 Claims**



1. A device for locking a spoke-wheeled vehicle to a stationary support comprising three legs of hardened steel bar stock, two of said legs being joined to the third leg at opposite ends of the latter to form a substantially split triangle shaped device, the said third leg forming the base of the triangle and the other two legs forming the sides thereof with the split occurring between the outer adjacent ends of the latter, means for interlocking the outer ends of the side legs together to form a closed triangle locking mechanism, the base leg being of sufficient length to span the shortest distance between the spoked front and rear wheel rims of a vehicle, and the side legs being of sufficient length to project through the spoked front and rear wheels and embrace a stationary support, said substantially split triangle being formed from one continuous length of bar stock bent in two locations to form the triangular configuration.

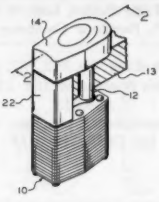
3,908,415

PADLOCK WITH DEFLECTABLE SHACKLE SECTION

Daniel J. Foote, Wauwatosa, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Filed May 28, 1974, Ser. No. 473,399
Int. Cl.² E05B *67/06*
U.S. Cl. 70—49 **7 Claims**

1. In a padlock which includes a body with a shackle movably extending into said body, the shackle having a first leg and a second leg, the latter being reciprocatable free of the body, a head bridging the outer end portions of the shackle legs, means connecting the head to the outer end portions of the legs with the connection between the head and one of the legs being loose so that when the shackle has said second leg reciprocated free of the body a section of the shackle may be deflected outwardly to temporarily widen the entrance into the shackle between the legs thereof, and a massive post which



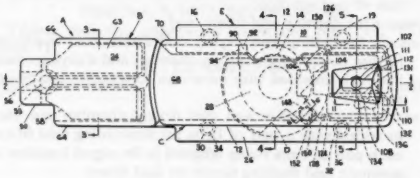
surrounds that portion of the first leg which is exposed when the shackle is in its inwardly reciprocated position relative to the body.

3,908,416

LATCHING DEVICE

Henry Heine, Vernon, and Irving Feinberg, Saddle Brook, both of N.J., assignors to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.

Filed Oct. 10, 1973, Ser. No. 405,119
Int. Cl.² E05B *65/52*
U.S. Cl. 70—71 **15 Claims**



1. A latching device cooperable with a hasp, the latching device comprising:

a frame having a projection thereon;

a manually operable latch member pivotally mounted on the projection, the latch member being adapted to engage a hasp and draw the hasp toward the frame as the latch member is rotated in one direction to a closed position wherein the latch member substantially overlies the frame and to release the hasp as the latch member is rotated in the opposite direction to an open position wherein the latch member is substantially perpendicular to the frame; and

a leaf spring cooperable with means provided by the frame and with means provided by the latch member to bias the latch member toward the frame and against said projection.

3,908,417

LOCK

André Emile Beudat, Thann, France, assignor to Beauside Patentverwertungs AG, Zurich, Switzerland

Filed Mar. 4, 1974, Ser. No. 447,954
Claims priority, application Germany, Mar. 9, 1973, 2311811
Int. Cl.² E02B *65/08, 27/08, 33/00*
U.S. Cl. 70—100 **3 Claims**

1. A lock, comprising

a casing,

a cylinder rotatably mounted in a bore in said casing and having an internal longitudinally extending bore adapted to receive a key,

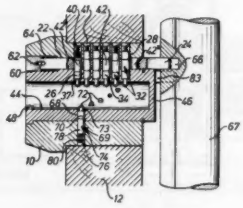
a reciprocable locking bolt mounted in an axially extending groove formed in the wall of said bore in said casing, and axially displaceable in said groove between a locking

position and an inoperative position, and having therethrough a plurality of spaced, transversally extending holes,

spring means normally urging said locking bolt to inoperative position, and

a plurality of movable tumblers mounted in said holes and projecting at opposite ends into registering holes formed, respectively, in said cylinder and said casing,

each of said tumblers being subdivided in its longitudinal direction into a plurality of separate elements at least certain of which normally project from said bolt into said registering holes in said cylinder and said casing to lock said bolt and said cylinder against movement in said casing, and



means operative upon introduction of a key into the bore of said cylinder to cause release of said locking bolt and said cylinder from said tumblers to permit axial displacement of said bolt and rotation of said cylinder, respectively,

one of said elements of each of said tumblers having the same axial length as the associated hole in said locking bolt, and

said last-named means being operative upon introduction of the key in the bore in said cylinder to shift said one element of each tumbler wholly into the associated hole in said locking bolt, whereby said locking bolt remains in the position, locking or inoperative, respectively, which it has been occupying until the key is introduced into said bore.

3,908,418

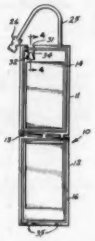
KEY HOLDER

John F. Stoffel, Yonkers, N.Y., assignor to Stoffel Seals Corporation, Tuckahoe, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,707

Int. Cl.² A47G *29/10*

U.S. Cl. 70—456 R **8 Claims**



1. An article holder for removably holding at least one article comprising first and second members, hinge means swingably joining said first member to said second member, means for connecting said first and second members together in assembled relationship, a retainer having one end fixed to one of said members, a head fixed to the other end of said retainer, said one member having a recess cooperatively receiving said head, and the other of said members being in abutting relationship with said head when said first and second members are in assembled relationship, whereby said other member maintains said one member and said head in assembled relationship.

3,908,419

HIGH ENERGY FORMING

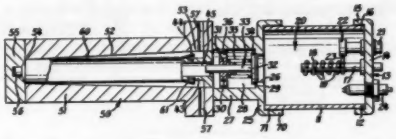
Thomas Duncan Brownbill, London, England, assignor to John Dale Limited, London, England

Filed Nov. 13, 1973, Ser. No. 415,371

Claims priority, application United Kingdom, Nov. 17, 1972, 53264/72; Feb. 20, 1973, 08359/73

Int. Cl. B21d *26/08*

U.S. Cl. 72—56 **10 Claims**



1. A method of shaping articles which method comprises placing an article to be shaped in a forming chamber including a die surface of the desired shape, introducing a combustible mixture into a combustion chamber, igniting said mixture within said combustion chamber, confining the products of combustion within said chamber until a predetermined threshold pressure is reached, and then allowing the products of combustion to pass into the forming chamber to expand the article against the die surface.

3,908,420

APPARATUS FOR FORMING MATERIAL USING A SKEW-ROLLING MILL

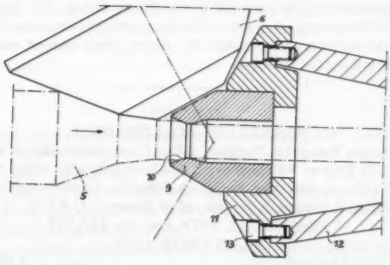
Amit Kumar Biswas, Kaarst; Hugo Feldmann, Hongen; Friedrich Wilhelm Hollmann, Neuss-Ruschenberg, and Erich Bretschneider, Buderich, all of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 17, 1974, Ser. No. 507,140

Claims priority, application Germany, Sept. 19, 1973, 2347023

Int. Cl.² B21B *15/00*

U.S. Cl. 72—68 **4 Claims**



1. Apparatus for forming material, comprising a skew-rolling mill for rolling said material to form rolled material and impart an axial thrust thereto, said mill having an exit, and an extrusion die immediately adjacent said exit and in the path of said rolled material whereby said rolled material is fed through said die by said axial thrust, said working rolls having inclined faces which surround a conical space as said working rolls rotate during the operation of said mill, and wherein said die has an outer shape corresponding to said conical space.

3,908,421

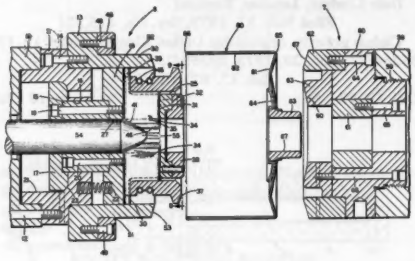
APPARATUS FOR MAKING MULTI-GROOVE PULLEYS

Robert J. Killian, North Canton, and Nolte V. Sproul, Canton, both of Ohio, assignors to Aspro, Inc., Canton, Ohio

Division of Ser. No. 407,942, Oct. 19, 1973, Pat. No. 3,852,863. This application Sept. 18, 1974, Ser. No. 507,221

Int. Cl.[2] B21D *22/16*

U.S. Cl. 72—82 11 Claims



1. In apparatus for forming multi V-groove sheet metal pulleys of a type in which the cylindrical side wall of a cup-shaped sheet metal blank is clamped axially between rotatable and relatively axially movable headstock and tailstock die assemblies and subjected to axial pressure while V-shaped grooves are being roller-spun in portions of said cup cylindrical side wall, and in which inner portions of the cup side wall are engaged and supported during roller spinning by groove support die segments radially movable between the headstock and tailstock die assemblies and axially movable relative to the headstock and tailstock die assemblies; the improvement including a cylindrical headstock outer die sleeve having an inner cylindrical surface; a cylindrical insert mounted and axially slidable within the headstock die assembly located within the outer die sleeve, the insert having a sleeve projecting toward the tailstock spaced from and concentric with the outer die sleeve inner cylindrical surface and formed with a series of radially-extending slots elongated axially in cross-section; a series of segments carried by said insert, each segment having a tongue radially-movable in one of the insert slots, an arcuate flange at the outer end of each tongue projecting toward the tailstock and located between the insert sleeve and outer die sleeve, and a radially-projecting groove support die segment portion on said flange trapezoidal in cross section; mandrel means axially movable within the headstock die assembly engageable with the segment tongues to move the segments radially outward of the insert sleeve; and the segment flange engaging and being supported by the inner cylindrical surface of the outer die sleeve when moved radially outward by the mandrel.

3,908,422

PLANETARY ROLLING MILL

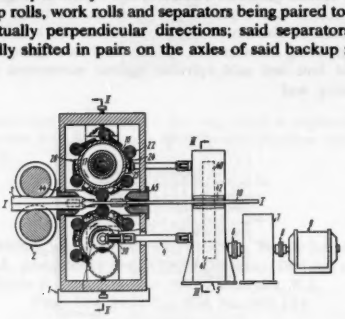
Alexandr Ivanovich Tselikov, ulitsa Chernyakhovskogo, 4, kv. 127; Evgeny Alexandrovich Zhukevich-Stosha, ulitsa Mira, 43, kv. 5, and Oleg Pavlovich Soloviev, Novo-Alexeevskaya ulitsa, 4, korpus 3, kv. 86, all of Moscow, U.S.S.R.

Filed Nov. 13, 1973, Ser. No. 415,377

Int. Cl.[2] B21B *13/20*

U.S. Cl. 72—190 2 Claims

1. A planetary rolling mill comprising: a working stand having a housing, an electric motor with a drive connected to said working stand; a plurality of planetary roll assemblies arranged in said housing, each of said planetary roll assemblies including an idle backup roll; a drive axle mounting said backup roll; bearing chucks in said stand housing supporting said drive axle, in eccentric portion on said drive axle on which said backup roll is freely rotatably supported; a set of work rolls positioned about the periphery of the outer cylindrical surface of said backup roll having the axles thereof in parallel with the axle of said backup roll and resting on the latter; a drive separator freely rotating relative to said work rolls; a device for rotating said axle of the backup rolls being operatively connected to said electric motor; a gear train having a gear ratio equal to the number of said work rolls in each said assembly, said gear train transmitting rotation to said separator from said backup roll axle in a direction coinciding with the direction of rotation of the axle of said backup roll; said planetary roll assemblies with the axles of said backup rolls, work rolls and separators being paired to extend in mutually perpendicular directions; said separators being mutually shifted in pairs on the axles of said backup rolls by



one-half a pitch of said work rolls and said eccentrics being mutually shifted in pairs by half a turn; said eccentrics and separators being collectively coupled therewith for concurrent rotation, the pairs of the work rolls alternately reducing a billet in two mutually perpendicular directions and, with the axis of rotation of said backup roll being displaced relative to the axle thereof and arranged eccentrically about the latter, the summation of the peripheral motion of said separators and the travel of the centers of rotation of said backup rolls causing the resultant travel of the centers of rotation of said work rolls to assume the form of a curve having a portion approximately linear and extending in parallel to the axis of rolling.

3,908,423

ROD AND BAR MILL

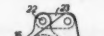
Alexander Ian Wilson, Sheffield, England, assignor to Hille Engineering Company Limited, Sheffield, England

Filed May 20, 1974, Ser. No. 471,832

Claims priority, application United Kingdom, May 18, 1973, 23699/73

Int. Cl.[2] B21B *13/20*

U.S. Cl. 72—190 17 Claims



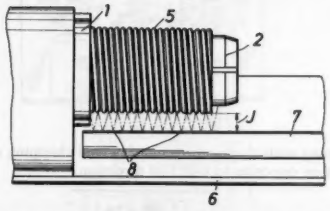
1. A rod or bar mill stand for giving a primary reduction to a workpiece, comprising a housing, a pair of mountings swingingly supported by the housing on opposite sides of the pass-line, a work roll carried by each mounting and designed to effect a first reduction of the workpiece to a rod or bar, means for driving the mountings in a synchronous movement in which the work roll axes are constrained to move in closed paths which, over a limited part, approach the pass-line so that, in use, the rolls intermittently and simultaneously engage the workpiece on opposite sides; and means for driving each

work roll about its axis to give a peripheral speed differing from the peripheral speed of the roll surfaces due to the driving means for the mounting, such that the workpiece is urged by the work rolls in the feed direction.

3,908,424
COIL WINDER COOLING DEVICE

Karl-Heinz Spiecker, Duisburg; Wolfgang Mudersbach, Dinslaken, and Rolf Michel, Duisburg, all of Germany, assignors to Demag Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 394,983, Sept. 7, 1973, abandoned. This application Dec. 14, 1973, Ser. No. 424,806
Int. Cl.² B21B *45/02*
U.S. Cl. 72—201 **12 Claims**

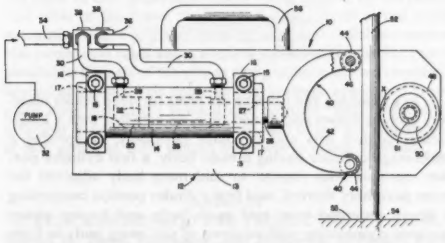


1. A process for cooling wire emerging hot rolled from the output stand of a rolling mill train; the steps which comprise
   a. winding said wire into coil form on a winding drum;
   b. said winding drum having an axial length longer than the diameter of said wire being coiled for accommodating a plurality of windings of said wire in a single layer on said drum;
   c. winding a plurality of layers of said wire on said drum;
   d. simultaneously with said winding, applying liquid cooling medium to a portion of the circumferential extent of each outermost layer of coiled wire as it is progressively wound on said drum; and
   e. exposing the remainder of said circumferential extent of said outermost layer of coiled wire to ambient air.

3,908,425
ROD BENDING APPARATUS AND METHOD

Donald G. Ware, 11262 Sierra, Fontana, Calif. 92335

Filed Jan. 4, 1974, Ser. No. 430,631
Int. Cl.² B21D *7/024*
U.S. Cl. 72—217 **7 Claims**

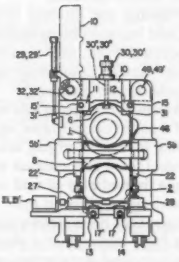


1. Apparatus for bending elongated members comprising:
   a. a rigid, portable frame having means that define a mounting side surface;
   b. a hydraulic cylinder means mounted on said side surface and with its axis generally parallel to said side surface;
   c. force exerting roller means coupled to the cylinder means for reciprocating movement in the direction of said axis, said force exerting means being movable between a rearward position and a forward position upon energization of said hydrailic cylinder means;
   d. reaction roller means mounted on said side surface and spaced forwardly from the force exerting means when the latter is in its rearward position a sufficient distance to permit an intermediate portion of an elongated structural member to be disposed in the space therebetween,
   e. a separate hydraulic fluid pumping unit connected by flexible hose means to and in fluid communication with said cylinder means supported by structure other than said frame; and
   f. handle means on said frame for supporting said frame, cylinder means, force exerting roller means and reaction roller means for permitting movement thereof relative to the portion of the axis of an elongated member prior to bending thereof, as said elongated member is bent by force exerted thereon by said cylinder means and roller means;
   g. said handle means and the member being bent providing the entire support for said frame, cylinder means, force exerting roller means and reaction roller means during bending of said member.

3,908,426
OPEN TOP HOUSING TYPE UNIVERSAL ROLLING MILL

Keiichi Aramaki, Fukuyama, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1974, Ser. No. 497,189
Claims priority, application Japan, Sept. 4, 1973, 48-98919
Int. Cl.² B21B *31/30, 31/08*
U.S. Cl. 72—238 **5 Claims**



1. An open top housing type universal rolling mill comprising:
   an open top housing;
   top, bottom and vertical rolls mounted in said housing;
   a chock associated with and coupled to each of said top, bottom and vertical rolls;
   said housing having a housing window in the vicinity of each of said docks;
   a pair of double-wedge roll gap adjusting means coupled to each of said chocks, said pair of roll gap adjusting means of said each chock each comprising wedges arranged adjacent to the inner surface of a respective housing window for guiding said roll associated with said each chock, each of said wedges of said pair of roll gap adjusting means being movable and adjustable in a plane substantially parallel to the corresponding plane of a plurality of rolling planes of said rolling mill and in a direction normal to the direction of travel of a piece to be rolled.

3,908,427

EXTRUSION TOOL

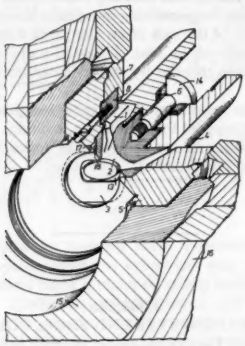
Bernhard Wozniak, and Ernst Kaffenberger, both of Backnang, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Apr. 24, 1974, Ser. No. 463,815

Claims priority, application Germany, Apr. 30, 1973, 2321770; Apr. 30, 1973, 7316299

Int. Cl.[2] B21C *23/04*

U.S. Cl. 72—264 10 Claims



1. An extrusion tool for extruding tubular products, comprising in combination:

a. a die holder;

b. a die supported by said die holder, said die including means defining a die opening through which the tubular product is extruded and which determines the external boundaries of the tubular product;

c. a mandrel determining the internal boundaries of the tubular product, said mandrel being formed of a mandrel cylinder and a mandrel front, said mandrel cylinder and said mandrel front having coinciding longitudinal axes constituting the axis of said mandrel;

d. first connecting means for coupling said mandrel cylinder and said mandrel front to one another, said first connecting means including means for urging said mandrel cylinder and said mandrel front into contact with one another and for providing a limited play of said mandrel cylinder with respect to said mandrel front; and

e. second connecting means for coupling said mandrel front to said die holder form-lockingly in a plane normal to the mandrel axis, said second connecting means including form-locking means for preventing said mandrel front from executing radial shifts and rotation about said axis.

3,908,428

STRETCH-DRAW METAL FORMING

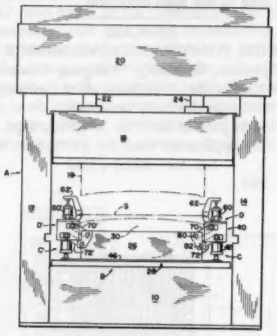
Robert A. MacKenzie, 8351 Lucerne Dr., Chagrin Falls, Ohio 44022

Filed Jan. 18, 1974, Ser. No. 434,661

Int. Cl.[2] B21D *11/04*

U.S. Cl. 72—296 22 Claims

1. In apparatus for stretch-drawing a metal sheet, work clamping units for location adjacent to opposite ends of a die having a nonplanar work face, means supporting said clamping units for movement in opposite directions relative to the die transversely of the work face of the die and at least one of said clamping units lengthwise of the work face of the die, and means causing at least one of said clamping units to follow a predetermined path lengthwise of the work face of the die in the direction away therefrom to increase the relative distance between said clamping units during movement of said clamping units in one direction transversely of the working face of the die and further causing at least one of said clamping units to follow a different path lengthwise of the working face of the die without decreasing the relative distance between said



clamping units during movement of said clamping units in the direction opposite to said one direction.

3,908,429

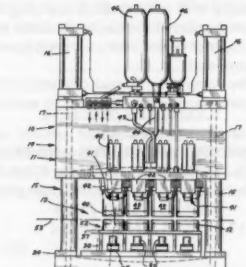
HYDRAULIC SERVO VALVE CONTROLLED CUPPING PRESS

Martin M. Gram, Minneapolis, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed Jan. 21, 1974, Ser. No. 434,908

Int. Cl.[2] B21D *22/22*

U.S. Cl. 72—349 17 Claims

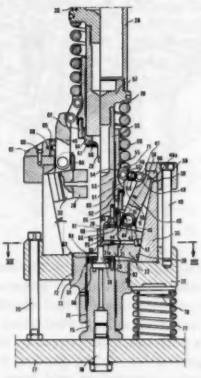


1. In a blanking and forming die press for deep drawn members such as drawn and ironed cans, an actuator with a longitudinal central axis and an outer periphery, comprising a multi-stage cylinder having a main body, a first cylinder portion movable with respect to said main body adjacent the outer periphery thereof, said first cylinder portion comprising a sleeve mounted over said main body and having piston portions cooperating with portions of said main body to form a fluid cylinder operable to move said sleeve with respect to said main body between a cutting and a retracted position, a hold down member, means defining a hold down cylinder and piston combination acting between said hold down member and said main body, and means to actuate said hold down cylinder to force said hold down member away from said main body, and cooperating means between said sleeve and said hold down member operable to retract said hold down member when said sleeve is retracted, but to permit movement of said sleeve toward its cutting position independently of said hold down member.

3,908,430
APPARATUS FOR COLD-FORMING METAL WORKPIECES

Michel Orain, Conflans-Sainte-Honorine, France, assignor to Societe Anonyme: Glaenzer Spicer, Poissy, France

Filed Apr. 5, 1974, Ser. No. 458,227
Claims priority, application France, Apr. 17, 1973, 73.13830
Int. Cl.² B21J 9/02
U.S. Cl. 72—353 12 Claims



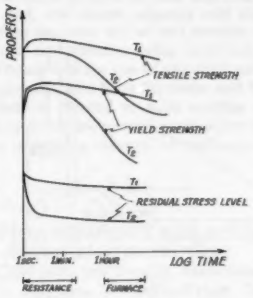
1. A setup for a press including a piston and a table for cold-forming metal parts of the type having a central body and generally radially projecting portions extending outwardly from the central body starting with substantially cylindrical metal billets, said setup comprising a first assembly including a multi-part die together defining a cavity of of a shape corresponding to the shape of the part to be formed, said cavity including a central chamber cavity and radially projecting cavities adapted to receive corresponding portions of the part being formed, said die having openings therein for receiving punches, and a second assembly including punches adapted to penetrate into said die through the openings, the parts of the die of said first assembly and the punches of the second assembly defining metal forming parts of the setup, the metal forming parts of one of the assemblies being carried by the piston and table of the press, the metal forming parts of the other assembly being carried by rams for axial and radial movement therewith, said rams being slidably mounted for displacement parallel to the axis of the piston along oblique slotted members spaced about said axis and clamped between upper and lower plate members urged toward one another, said rams being arranged to be driven along at least part of the working stroke of said piston in their slotted members to come together.

3,908,431
STEELS AND METHOD FOR PRODUCTION OF SAME

Samuel H. Jones, Flossmoor, and James M. McNeany, Park Forest South, both of Ill., assignors to LaSalle Steel Company, Chicago, Ill.

Filed May 7, 1974, Ser. No. 467,639
Int. Cl.² B21C 9/00
U.S. Cl. 72—364 20 Claims

1. A method for the manufacture of stress relieved, prestrengthened elongated steel workpieces comprising the steps of cold working a workpiece formed of a carbon or low alloy steel to pre-strengthen the workpiece, straightening the workpiece by reverse bending and rapidly heating the workpiece to a temperature within the range of 500°F to the critical temperature of the steel in less than 10 minutes whereby the workpiece is stress relieved such that high levels of mechanical properties are maintained with low levels of residual stress.



3,908,432
PROCESS FOR PRODUCING A HIGH MAGNETIC FLUX DENSITY GRAIN-ORIENTED ELECTRICAL STEEL SHEET

Tadashi Ichiyama, Sagamihara; Takashi Sato, and Tsuyoshi Kikuchi, both of Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Mar. 14, 1974, Ser. No. 451,231
Claims priority, application Japan, Mar. 20, 1973, 48-31452
Int. Cl.² B21B 3/02
U.S. Cl. 72—365 2 Claims

1. Process for producing a high magnetic flux density grain-oriented electrical steel sheet comprising: subjecting silicon steel ingot containing 0.005 to 0.1% of carbon, 2.5 to 4.0% of silicon, 0.01 to 0.10% of selenium and one of an element selected from the group consisting of 0.01 to 0.15% of arsenic, 0.02 to 0.3% of bismuth, 0.02 to 0.3% of lead, and 0.02 to 0.2% of antimony with a sulfur content not more than 0.01% to cold rolling in which the reduction of the final cold rolling step is not less than 70%, then decarburization and final annealing.

3,908,433
ROD FORMING MECHANISM

Russell H. Helzer, 336 NW. 10th, Ontario, Oreg. 97914

Filed Nov. 26, 1974, Ser. No. 520,331
Int. Cl.² B21D 9/05, 31/00
U.S. Cl. 72—388 6 Claims

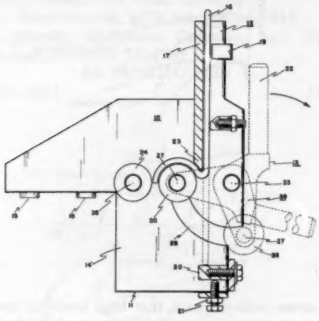
1. A rod forming mechanism, comprising:

a frame including suitably joined and reinforced vertical, parallelly disposed walls being open at one of their vertical ends;

a rod securing guide being mounted to said frame, said guide providing means for retaining a selected length of rod in a vertical position distally adjacent said open vertical edge of said frame; and

a rod forming assembly including a forming lever pivotally mounted at its center to said frame adjacent said open end, a roller mounted at the lower end of said forming lever provided at the end of said forming lever opposite said roller and means for applying force rotating said formed lever at its pivot, a return bend shoe being disposed between said frame walls with the lowermost terminal end of said shoe being in substantial alignment with said pivot of said forming lever, and a stationary forming roller being disposed rearwardly of said lever, between said frame walls, the distance between said actuating lever pivot and the center of said stationary roller being

sufficient to accommodate said roller carried on said lever and thicknesses of rod when said roller carried on



said lever is disposed between said return bend shoe and said stationary roller.

3,908,434

HAMMER FORGING DEVICE

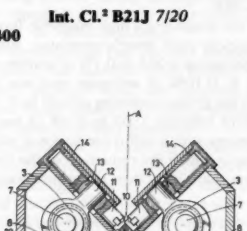
Bernd Ribback, rue de Mertert 48, Wasserbillig, Luxembourg

Filed Mar. 25, 1974, Ser. No. 454,518

Claims priority, application Germany, Apr. 4, 1973, 2316801

Int. Cl.[2] B21J 7/20

U.S. Cl. 72—400 3 Claims



1. A forging device for forging a variety of cross sectional profiles preferably from rod material which is deformed between hammer and pressure surfaces comprising two hammers inclined at right angles toward each other, a common drive means for driving the hammers against forging supports, and carrier means for guiding the hammers linearly against the forging supports, linear guides inclined at right angles to each other for guiding said carrier means, rotatable shaft bodies for moving the inclined hammers, and wherein said common drive means comprises arm levers each pivotably mounted on an eccentric pivot shaft, the ends of said levers moving said hammers toward the forging supports.

3,908,435

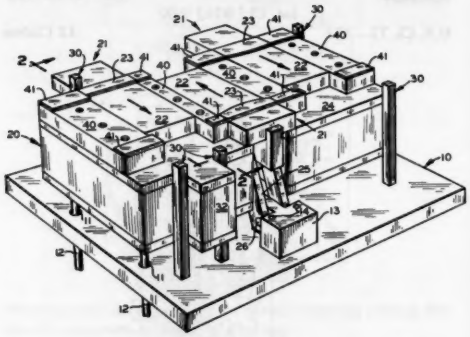
EDGE BENDING PRESS

Miles Augustus Bowman, Jr., Reading; Christopher James Hampton, Boyertown, and Paul Henry Schock, Reading, all of Pa., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 2, 1974, Ser. No. 528,616

Int. Cl.[2] B21D 11/07

U.S. Cl. 72—411 14 Claims



1. An apparatus for bending a workpiece in a single plane comprising a base, a bed member generally parallel to said base, guide means to permit said bed member to move toward and away from said base and prevent other relative movement therebetween, a push block supported by and extending above said bed and guided for sliding motion transversely thereof and linkage means connecting said base and said block to move the latter across said bed as said bed is moved relative to said base.

3,908,436

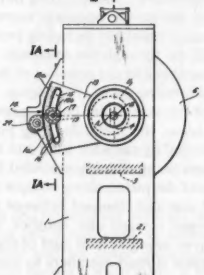
POWER PRESS WITH OVERLOAD PROTECTION

Werner Bothe, Dusseldorf, Germany, assignor to Maschinenfabrik Hasenclever GmbH, Dusseldorf, Germany

Filed May 1, 1974, Ser. No. 466,001

Int. Cl.[2] B21J 9/18

U.S. Cl. 72—431 10 Claims



1. A power press comprising:

a stationary frame forming a fixed anvil;

a hammer co-operating with said anvil for deforming a workpiece interposed therebetween;

drive means for reciprocating said hammer on said frame, said drive means including a shaft, an eccentric coupling between said shaft and said hammer, and sleeve means forming an eccentric bearing for said shaft, said sleeve means being rotatably journaled in said frame and being centered on a swing axis offset from the shaft axis in a direction generally transverse to the path of hammer

reciprocation whereby the reaction force of a workpiece struck by said hammer exerts a torque upon said sleeve means tending to rotate same about said swing axis;

a member integral with said sleeve means rotatable therewith about said swing axis; and

yieldable restraining means engaging said member at a location remote from said swing axis for normally preventing any rotation thereof.

3,908,437
POWER PRESS WITH A FLYWHEEL AND SPINDLE DRIVE

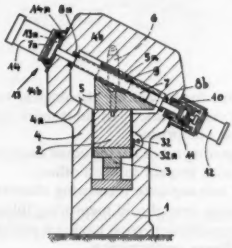
Horst Bachmann, Einberg, Germany, assignor to Langenstein & Schemann Aktiengesellschaft, Coburg, Germany

Division of Ser. No. 116,507, Feb. 18, 1971, abandoned. This application Aug. 29, 1973, Ser. No. 392,486

Claims priority, application Germany, Feb. 19, 1970, 2007505

Int. Cl.² B21J *9/10*

U.S. Cl. 72—452 **3 Claims**



1. A power press comprising a press head, an anvil, a ram for upward and downward movement relative to said anvil, and drive means for said ram, said drive means including a spindle, a flywheel, a switchable clutch connecting said flywheel to one end of said spindle, a motor operably connected to said flywheel and continuously rotating in one direction, and a second motor operably connected to the other end of said spindle, said second motor being reversible, whereby when said clutch is engaged said continuously rotating motor moves said ram in the direction of impact and said ram is moved only by said reversible motor when said clutch is disengaged.

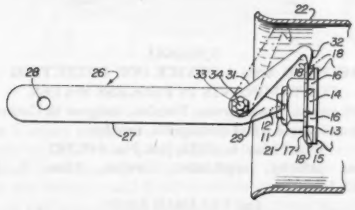
3,908,438
LOCK WASHER TAB STRAIGHTENING TOOL

Wallace E. Norden, 323 Beverly Ave., Millbrae, Calif. 94030

Filed Nov. 15, 1974, Ser. No. 523,960

Int. Cl.² B21J *13/08*

U.S. Cl. 72—458 **3 Claims**



1. A tool for the purpose of straightening a lock washer tab bent into the inter-lug depression between adjacent lugs of a castellated splined spacer and wherein there is a tube surrounding the lock washer with insufficient annular space between said tube and said washer for lateral approach to said tab and wherein said washer and spacer are installed on the threaded end of a shaft having a conical centering depression at its outer end, said tool comprising a handle having a tapered distal end shaped to fit into said centering depression, a hook member formed with a hook at its outer end and an aperture near its inner end, and means adjacent said distal end for pivotally attaching the inner end of said member to said handle, the length of said member being such that, when said handle is tilted relative to the axis of said shaft with said distal end in said depression, said hook fits under said bent tab and when said handle is pivoted to axial position said tab is straightened to approximately radial position out of said inter-lug depression, permitting removal of said lock washer and said spacer.

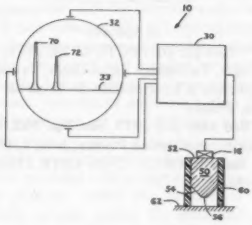
3,908,439
FLAT BOTTOM REFERENCE REFLECTORS FOR ULTRASONIC INSPECTION

Andrew Pelak, Garfield, and Fred H. Michelsohn, Wyckoff, both of N.J., assignors to Curtiss-Wright Corporation, Wood Ridge, N.J.

Filed Sept. 24, 1974, Ser. No. 508,770

Int. Cl.² G01L *25/00*

U.S. Cl. 73—1 R **5 Claims**



4. A set of reference blocks for use in calibrating ultrasonic flaw detection test equipment, said set including at least three blocks each having a relatively large flat surface at one end and through which ultrasonic energy is to be introduced into the block with the other end of said block being tapered to a relatively small flat surface at the extreme end of the block remote from its large end surface, said small surface of each block being parallel to its larger end surface and from which at least a substantial portion of said ultrasonic energy is to be reflected back to said large end surface, said blocks having different lengths but having the same diameter reflecting end surfaces.

3,908,440
METHOD AND APPARATUS FOR FIRE TESTING GYPSUM BOARDS AND THE LIKE

James L. Houser, Berwyn Heights, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Sept. 4, 1974, Ser. No. 503,129

Int. Cl.² G01N *3/18*

U.S. Cl. 73—15.6 **8 Claims**

1. Apparatus for testing the fire resistance of a test strip of wallboard and the like which comprises:

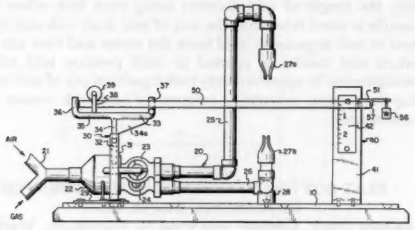
a pair of opposed and spaced apart gas burners aligned with each other along a substantially vertical axis;

a horizontal axis located between the pair of burners;

swivelled clamping means adapted to hold one end of said test strip and to move it into and out of said vertical axis, the other end of said test strip being unrestrained, said clamping means being located along the horizontal axis and spaced from said burners;

whereby when said test strip is moved into said vertical axis it is disposed along a horizontal axis bisecting the said vertical axis;

measuring means including indicia aligned with the horizontal axis and spaced from the burners in a direction opposite from the clamping means; and



means for applying a force to the unrestrained end of said test strip.

3,908,441

LEVEL DETECTING DEVICE

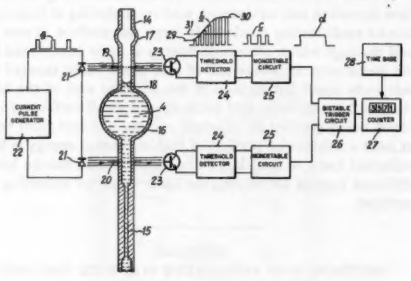
Jean M. Virloget, Le Mesnil Saint-Denis, France, assignor to Societe Francaise d'Instruments de Controle et d'Analyses, Saint-Denis, France

Filed May 21, 1973, Ser. No. 362,080

Claims priority, application France, June 2, 1972, 72.19838

Int. Cl.[2] G01N *11/06*; G01F *23/00*

U.S. Cl. 73—55 **9 Claims**



1. A device for detecting the level of a liquid in a tube at least at a predetermined region of the tube, said device comprising a transparent tube containing a liquid which is displaced in the tube and which forms a displaceable meniscus in the tube, a radiation source disposed on one side of the tube with regard to the predetermined region thereof, said radiation source comprising means for emitting light impulses incident on a first zone of the periphery of the tube at said predetermined region, the emitting means comprising a pulse source including a circuit containing a current pulse generator means, a photo-electric cell sensitive to the presence and absence of said light impulses located in facing relation with a second zone of the periphery of the tube in said region for receiving that fraction of the radiation which has undergone total reflection in proximity with the internal face of the tube when the tube contains air instead of liquid.

3,908,442

APPARATUS FOR MEASURING RHEOLOGICAL VALUES OF SUBSTANCES CAPABLE OF FLOWING

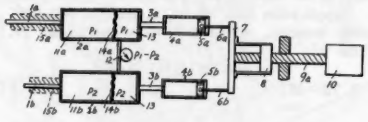
Horst Chmiel, 12, Paul-Rontgen-Strasse, 5100 Aachen, Germany

Filed Apr. 2, 1974, Ser. No. 457,306

Claims priority, application Germany, Apr. 6, 1973, 2317321

Int. Cl.[2] G01N *11/04*

U.S. Cl. 73—55 **3 Claims**



1. Apparatus for measuring rheological values such as the viscosity and visco-elasticity of substances capable of flowing, said apparatus comprising:

a. two measuring tubes having equal diameters and different lengths with respect to each other,

b. each of two separate measuring chambers connected to a respective one of said measuring tubes,

c. two pump cylinders each having a piston and rod and the same delivery performance,

d. conduits for connecting each of said pump cylinders to a respective one of said measuring chambers,

e. single means for driving the piston and rod of each pump cylinder simultaneously at an equal and constant speed,

f. a differential pressure meter connected to both of the chambers for indicating the differential pressure caused by the difference in the length of the measuring tubes,

g. said chambers each including a movable diaphragm, and

h. means for conveying a special driving liquid on one side of the diaphragms, through said pump cylinders and differential pressure meter.

3,908,443

METHOD AND A DEVICE FOR DETECTING CONTAMINANTS IN PROCESS WATER

Erik Hakansson, Landskrona, Sweden, assignor to Gotaverkin Oresundsvarvet AB, Landskrona, Sweden

Filed Mar. 6, 1974, Ser. No. 448,747

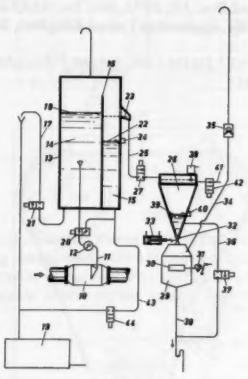
Claims priority, application Sweden, Mar. 7, 1973, 7303163-5

Int. Cl.[2] G01N *33/18*

U.S. Cl. 73—61.1 R **6 Claims**

1. A method of detecting the presence of contaminants such as oil and gasoline in process water, which comprises continuously dividing off a fraction of a body of water flowing through a conduit, subjecting the fraction to a settling procedure comprising at least one step in which a top layer is separated as a residue by way of a weir, and introducing this residue, during

an extended period of time, into a chamber provided with a heating means and connected to a gas detector which reacts



in the presence of smoke produced by the contact of contaminants contained in said residue with said heating means.

3,908,444

APPARATUS AND METHOD OF CLEARANCE AND VIBRATION MEASUREMENT IN ROTARY MACHINES

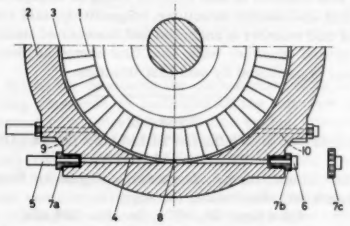
Udo Peter, c/o Kraftwerk, 8023 Hollriegelskreuth, Germany

Filed Aug. 20, 1973, Ser. No. 389,470

Claims priority, application Germany, Aug. 23, 1972, 2241436

Int. Cl. G01h *9/00*

U.S. Cl. 73—71.3 **13 Claims**



1. In a rotary machine having a rotor arranged for rotation in a fixed structure with a small radial clearance therefrom, an apparatus for detecting radial distortion, deviation or vibration of said rotor or said fixed structure comprising:

a bore (**4**) in said fixed structure (**2**) directed tangentially to said rotor (**1**) and communicating with the clearance space between said rotor and said fixed structure, so that the sight through said bore is partially obstructed by said rotor at least for some amount of distortion or deviation of said rotor or of said fixed structure; and

means (**5, 6**) for observing variations in the degree of obstruction (**8**) of the sight of said bore.

3,908,445

ULTRASONIC TRANSDUCER WITH COUPLING MEANS

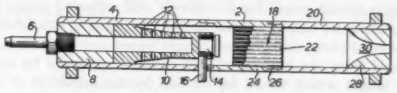
David Charles Verdon, and Victor Woodhouse, both of Newport, Wales, assignors to British Steel Corporation, London, England

Filed Aug. 17, 1973, Ser. No. 389,194

Claims priority, application United Kingdom, Aug. 18, 1972, 38701/72

Int. Cl.² G01N *29/00*

U.S. Cl. 73—71.5 US **7 Claims**



1. Apparatus for providing an extended liquid coupling to a body under ultrasonic test, comprising: an elongated housing of substantially tubular internal section incorporating in sequence, an inlet adapted to receive coupling liquid from a pressurized source, a diffuser disposed within said housing and comprising a substantially cylindrical member having one end closed and an outwardly extending annular wall at its other inlet end in engagement with the internal wall of said housing, the side wall of said substantially cylindrical member having a plurality of restrictive apertures extending generally normal to the axis of the interior of said housing for equalising liquid pressure across the housing section downstream of said diffuser, an ultrasonic transducer disposed within the region of the housing downstream of the diffuser, and means for straightening the flow of liquid extending completely across the housing so as to produce laminar flow from an outlet of the housing which is provided with a restriction ensuring positive internal liquid pressure within the portion of the housing disposed inwardly of said outlet, the inlet and outlet being provided at opposite end regions of the housing and in axial alignment, so as to produce within the housing an overall liquid flow which is substantially unidirectional and thereby tend to avoid turbulence induced ultrasonic reflecting interfaces.

3,908,446

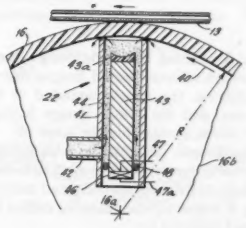
ULTRASONIC APPARATUS FOR WALL THICKNESS MEASUREMENT

Walter F. Mruk, 3700 Unit E, Albidale Dr., Huntingdon Valley, Pa. 19006

Filed Apr. 1, 1974, Ser. No. 456,842

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.8 S **6 Claims**



1. Apparatus for measuring the thickness of a moving elongated body; said apparatus comprising a hollow rotatable cylinder of acoustical energy transmission material and means rotatably mounting said rotatable cylinder; a transducer disposed in the interior of said rotatable cylinder; a source of fluid, which fluid acoustically couples said transducer to the interior of said rotatable cylinder; said moving elongated body moving over the outer surface of said cylinder; said transducer

comprising an elongated hollow cylinder and a source and receptor of acoustical pulses disposed within said cylinder; one end of said transducer cylinder being disposed adjacent to and closely spaced from the interior of said rotatable cylinder; said source of fluid connected to the interior of said transducer cylinder and producing a continuous fluid column extending from said source of acoustical pulses to said interior of said rotatable cylinder, whereby pulses from said source and receptor of acoustical pulses reflected by the opposite surfaces of said moving elongated body can be sensed by said source and receptor of acoustical pulses; and electronic processing circuit means for monitoring said reflected pulses and producing an output related to the thickness of said moving elongated body; said one end of said transducer cylinder being spaced from the interior of said rotatable cylinder by about the height which would be formed by the meniscus of said fluid in said transducer cylinder under static conditions; said transducer cylinder being vertically disposed with said one end of said transducer cylinder being upwardly disposed; fluid from said source of fluid continuously flowing out of said transducer cylinder and into the interior bottom of said rotatable cylinder.

3,908,447

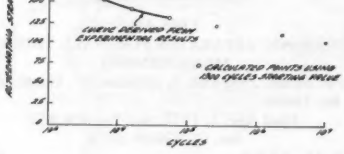
METHOD OF MEASURING ARTICLE FATIGUE LIFE

Trevor L. Salt, Beverly, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Jan. 15, 1973, Ser. No. 323,348

Int. Cl.² G01N 3/32

U.S. Cl. 73—91 **5 Claims**



1. A method for testing an article design intended to have at least a minimum selected useful fatigue life under certain operating conditions, the article intended to be made of a selected material, and the article design having an area of relatively high stress, comprising the steps of:

obtaining stress/strain data for the selected material;

obtaining stress intensity/crack growth data and at least one fatigue characteristic for the selected material;

determining a characteristic material defect length (λ) for the selected material by:

a. selecting at random a first characteristic material defect length for the selected material; and then

b. comparing and modifying the length of the initial characteristic material defect length with the stress/strain data and stress intensity/crack growth data in an iterative method until a characteristic material defect length (λ) matches the fatigue characteristic;

applying (λ) to the stress data to determine the useful fatigue life of the article in the relatively high stress area.

3,908,448

METHOD AND APPARATUS FOR TESTING RESISTANCE TO TRANSVERSE TORSIONAL VIBRATION OF TEETH OF FLEXIBLE POWER TRANSMISSION MEMBERS

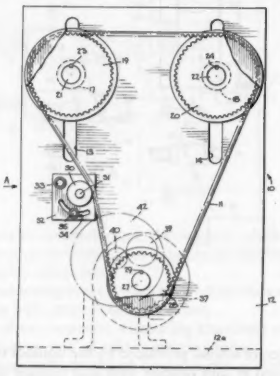
Robert D. Jardine, Dumfries, Scotland, and Henry G. Ellington, Preston, England, assignors to Uniroyal Limited, Midlothian, Scotland

Filed Dec. 10, 1973, Ser. No. 423,328

Claims priority, application United Kingdom, Dec. 13, 1972, 57436/72

Int. Cl.² G01N 3/00; G01M 7/00, 13/02

U.S. Cl. 73—91 **18 Claims**



5. A testing device for testing a toothed flexible power transmission member for resistance of the teeth thereof to torsional vibrations transverse to the teeth, comprising a support, a shaft rotatably mounted on said support, a first rigid structure mounted on said shaft for rotation therewith, said first structure being toothed for meshing engagement thereof with a juxtaposed section of said member, means for oscillating said shaft about its axis, and a second rigid structure arranged against movement with said shaft and relative to said support, said second structure being constructed for non-slip engagement with another section of said member, whereby upon said sections of said member being in engagement with said first and second structures, respectively, said other section of said member is anchored and maintained stationary by said second structure while said first-named section of said member is oscillated by said first structure.

3,908,449

CLAMPING DEVICE, ESPECIALLY FOR MATERIAL TESTING MACHINES

Guenter Zuber, Messel, Germany, assignor to Firma Carl Schenck AG, Darmstadt, Germany

Filed Sept. 26, 1974, Ser. No. 509,686

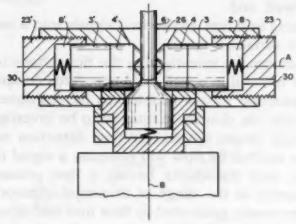
Claims priority, application Germany, Oct. 3, 1973, 2349686

Int. Cl.² G01N 3/04

U.S. Cl. 73—103 **18 Claims**

1. A clamping device for securely holding a workpiece, especially for material testing machines, comprising housing means having a first axis, axially aligned first bores in said housing means extending in the direction of said first axis, a workpiece receiving opening in said housing means having a second axis extending substantially at a right angle to said first axis, clamping piston means movably located in said axially aligned bores and having workpiece clamping ends facing toward said second axis for centrally clamping a workpiece relative to said second axis in said housing means, a further bore in said housing axially aligned with said second axis,

guide piston means axially movable in said further bore whereby the guide piston means is movable perpendicularly relative to the direction of movement of said clamping piston means, said guide piston means having guide surface means



contacting said clamping piston means, first means for urging said clamping piston means toward said workpiece and second means operatively associated with said guide piston means for urging said guide piston means against said clamping piston means.

3,908,450

DEVICE FOR THE DETERMINATION OF LIQUID CONSUMPTION

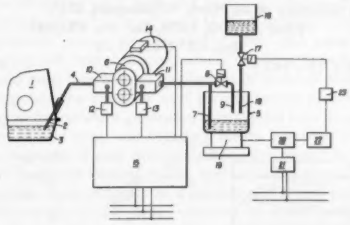
Erich Schreiber, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Sept. 10, 1974, Ser. No. 504,762

Claims priority, application Austria, Mar. 15, 1974, 2176/74

Int. Cl.² G01F 9/00

U.S. Cl. 73—113 **6 Claims**



1. A device for measuring the consumption of liquid from a sampling container, in particular of the lubricant or fuel consumption of an internal combustion engine, comprising a measuring vessel, an electric weighing device carrying said measuring vessel, a self-priming hydraulic pump having a reversible delivery direction and comprising two delivery apertures, two connecting lines, each of them emerging from one of said delivery apertures and having an open extremity, the open extremity of one of the two connecting lines protruding from above into said sampling container, the open extremity of the other connecting line protruding from above into said measuring vessel, a reserve tank located above the measuring vessel, a filling pipe emerging from said reserve tank and having an open extremity protruding from above into said measuring vessel, a solenoid valve inserted in said filling pipe, a carrier-frequency amplifier connected to the output of said weighing device, a voltage comparator with two inputs and one output, the first input of the voltage comparator being connected with the output of said carrier-frequency amplifier, the output of the voltage comparator being connected with said solenoid valve via an interposed time delay member, and a control mechanism for presetting a reference voltage corresponding to a predetermined rated weight of the liquid in the measuring vessel, said reference voltage being fed to the second input of the voltage comparator.

3,908,451

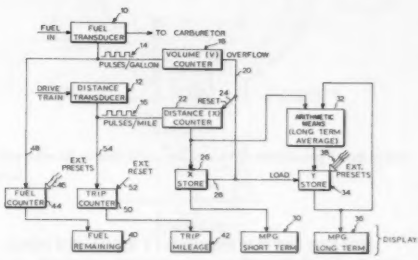
APPARATUS FOR MEASURING ENGINE FUEL EFFICIENCY

Monty C. Walker, Glendale, and Richard R. Williams, Downey, both of Calif., assignors to Quanta Systems, Inc., Van Nuys, Calif.

Filed Sept. 10, 1973, Ser. No. 395,826

Int. Cl.² G01M 15/00

U.S. Cl. 73—114 **12 Claims**



1. Apparatus for measuring and indicating the fuel efficiency of a fuel consuming engine comprising:

first means for generating an electrical output pulse in response to each unit measure of fuel consumed;

transducer means for producing a number of electrical pulses proportional to a measurable quantity produced by said engine;

counting means for counting the number of pulses produced by said transducer means during each unit interval between successive output pulses generated by said first means;

arithmetic means for producing a signal representative of the long term average of the counts produced by said counting means over a plurality of preceding unit intervals; and

indicator means for displaying a value proportional to said signal produced by said arithmetic means.

3,908,452

OVERLOAD TESTING OF CHAINS

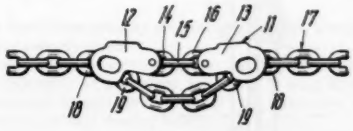
Werner Rieger, Haus Haselbach, 7084 Unterkochen, Wurttemberg, Germany

Filed Dec. 6, 1973, Ser. No. 422,409

Claims priority, application Germany, Dec. 6, 1972, 2260301

Int. Cl.² G01N 3/08

U.S. Cl. 73—143 **2 Claims**



1. A device for visually indicating the safe working load of a chain including interconnected links comprising a pair of chain-shortening dogs removably attachable to two spaced links of said chain, said dogs being interconnected by chain links, at least one of said last-mentioned links having a tensile strength less than the links of said chain whereby elongation thereof occurs when the safe working load on said chain links has been exceeded, said dogs being interconnected to said

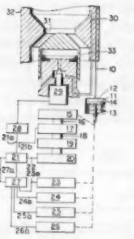
chain links so that the chain links intervening therebetween will be slack enabling any change in shape of said chain-shortening dog links to be visible.

3,908,453

APPARATUS AND METHOD FOR INDICATING AT THE SURFACE THE MEASUREMENT OF A DOWNHOLE CONDITION

John D. Jeter, P.O. Box 30293, Midland, Tex. 75230

Filed Oct. 24, 1973, Ser. No. 409,176
Int. Cl.² E21B 47/12
U.S. Cl. 73—151 **11 Claims**



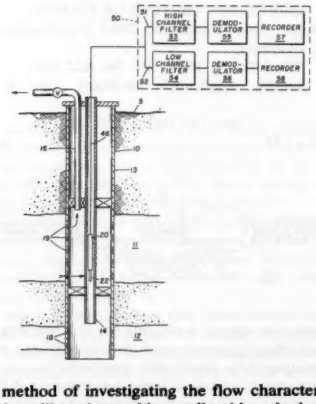
7. Apparatus for measuring from the surface a down-hole condition in a well bore with a pipe string positioned therein, comprising sensor means having a movable element that will assume a position responsive to the measurement of the down-hole condition, means controllable from the surface for holding the movable element from movement, from said position and means responsive to the position of the movable element for indicating at the surface the measurement of the downhole condition.

3,908,454

METHOD AND APPARATUS FOR LOGGING FLOW CHARACTERISTICS OF A WELL

Lynn D. Mullins, De Soto, and Willett F. Baldwin, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 297,097, Oct. 12, 1972, Pat. No. 3,816,773. This application Jan. 9, 1974, Ser. No. 432,129
Int. Cl.² E21B 47/12
U.S. Cl. 73—155 **22 Claims**



3. A method of investigating the flow characteristics of a downhole wellbore interval in a well, said method comprising:
generating a signal at said downhole interval in response to flow into said wellbore interval, said signal having dominant ultrasonic frequency components;
processing said generated signal at said downhole interval to provide a first signal having dominant ultrasonic frequency components indicative of said flow and a second signal having dominant ultrasonic frequency components indicative of flow which contains particulate material;
transmitting said first and second signals to the surface of said well; and
processing said first and second signals into a usable format at the surface.

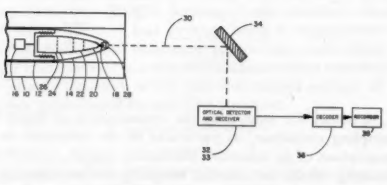
9. Apparatus for investigating the flow characteristics of a downhole interval in a well, said apparatus comprising:
flow detection means adapted to be positioned in a well adjacent the downhole interval to be investigated;
transducer means within said flow detection means which when excited by flow will generate a signal indicative of same, said transducer having a first primary resonant frequency in the range of dominant ultrasonic frequencies normally generated by flow into said downhole interval and a second primary resonant frequency in the range of dominant ultrasonic frequencies normally generated by flow containing particulate material into said downhole interval; and
circuitry means for processing said generated signal to produce a first processed signal having only dominant frequency components beginning near the lowest response of said first primary resonant frequency and greater and a second processed signal having only dominant frequency components in a narrow band centered about said second primary resonant frequency; and
means for transmitting said first and second signals to the surface of the well.

3,908,455

IN-BORE OPTICAL TELEMETRY SYSTEM

Larry R. Olson, and William S. Watson, both of Dahlgren, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 30, 1974, Ser. No. 493,442
Int. Cl.² G01L 5/14
U.S. Cl. 73—167 **8 Claims**

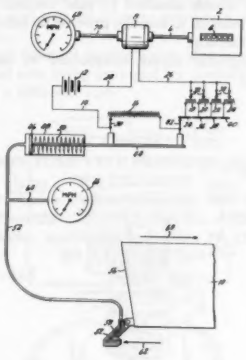


1. Apparatus for obtaining data representative of the travel of a projectile down the barrel of a gun and through the air comprising:
means adapted to be mounted in the projectile for generating electrical signals representative of the travel of the projectile;
a light emitting element adapted to be mounted in the nose of the projectile and electrically connected to said signal generating means for translating said signals into a modulated light beam transmitted along an axis in line with the bore of the gun and out the muzzle;
a detector for detecting the modulated light beam; and
means electrically connected to said detector for translating the detected beam into data representative of the travel of the projectile down the barrel of the gun and through the air.

3,908,456
ODOMETER FOR BOATS

Royal W. Riggs, 2406 Albert Lee, Sedalia, Mo. 65301

Filed Oct. 1, 1973, Ser. No. 402,043
Int. Cl.[2] G01C 21/12
U.S. Cl. 73—183 4 Claims



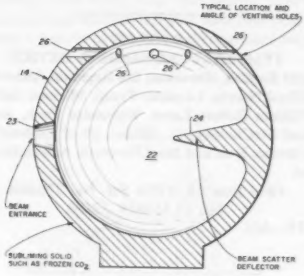
1. An odometer for boats comprising:
a. a counter,
b. variable speed driving means operable to drive said counter, and
c. control means operable to regulate the speed of said driving means proportionately to the speed of travel of a boat, said control means comprising a pitot tube adapted to be mounted on a boat and having an opening facing forwardly of said boat adjacent the hull thereof, pressure-responsive means interconnected with said pitot tube opening and operable responsively to pressure variations in said pitot tube caused by changes of speed of said boat to regulate the speed of said driving means proportionately to the pressure generated in said pitot tube by movement of said boat, and adjusting means operable to vary the response of said pressure-responsive means to pressure changes in said pitot tube, said adjusting means being operable independently in a plurality of zones over the speed range of the boat, whereby to compensate for non-linear proportionality between the pitot tube pressure and the actual speed of the boat.

3,908,457
HIGH ENERGY LASER POWER METER

Michael C. Drong, Ventura, Calif., and William M. Moeny, Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 7, 1974, Ser. No. 477,400
Int. Cl. G01k 17/00, 1/16
U.S. Cl. 73—190 R 10 Claims

1. A system for directly measuring the output beam power of high energy lasers and other directed high energy devices comprising:
a. a target means made from a subliming solid material for entrapping and absorbing the energy of an incident output beam from a high energy device being measured;
b. the incident energy from said output beam being converted to heat within said subliming solid target means, changing a portion of the subliming solid material directly into gas;
c. means for venting said gas from said target means;
d. means for measuring the rate of change of weight of said subliming solid target means to compute the incident power of said output beam, the rate of vaporization of said subliming solid target means being proportional to

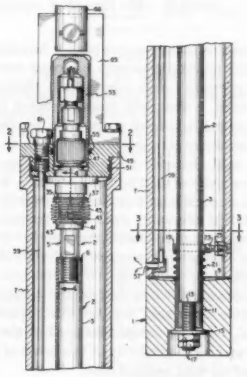


the rate of power absorption of the subliming solid material.

3,908,458
OPEN CHANNEL FLOW MEASURING DEVICE

Louis A. Pannullo, Waterbury, and Donald D. MacKenzie, Middlebury, both of Conn., assignors to American Chain & Cable Company, Bridgeport, Conn.

Filed Nov. 12, 1973, Ser. No. 415,137
Int. Cl.[2] G01F 1/28, 15/12
U.S. Cl. 73—198 17 Claims



1. A liquid flow velocity measuring apparatus, comprising:
a. first support means;
b. flow sensing means mounted on said first support means, positionable at a selected level in a flowing liquid for exposure to said flowing liquid and responsive to the velocity of said flowing liquid;
c. isolation means secured to said first support means for isolating said flow sensing means from the flow of the liquid at levels other than said selected level while exposing it to said flowing liquid at said selected level;
d. velocity sensing means for sensing displacement of said flow sensing means, said first support means, flow sensing means, isolation means, and velocity sensing means forming a probe for immersion in said flowing liquid;
e. bubbler outlet means mounted on said probe for expelling air into said flowing liquid;

f. conduit means for feeding air to said bubbler outlet means; and

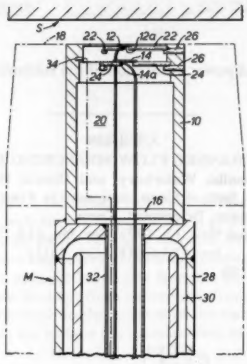
g. means for sensing the developed back pressure in said conduit as an indication of depth.

3,908,459

TEMPERATURE SENSING DEVICE

Paul Everitt English, Horsham; Ian Reginald Ashcroft, Purley; Paul Alfred Norris, London; Frank Michael Salter, Coulsdon; William Robert Laws, Worcester Park, and Herbert Raymond McChesney, St. Albans, all of England, assignors to The British Iron and Steel Research Association, London, England

Filed June 14, 1973, Ser. No. 370,026
Int. Cl.² G01K *13/00*
U.S. Cl. 73—341 **7 Claims**



1. A temperature sensor comprising a housing and at least two temperature sensing elements disposed within said housing, each said element being substantially thermally insulated from said housing, a first said element being located at one end of the housing whereby it may be positioned in close proximity to an object whose temperature is to be measured, and a second said element being spaced from said first element axially inwardly of said housing whereby it may measure an axial component of heat transferred inwardly of said housing from said first element, each said temperature sensing element comprising a plane metal member having a respective thermocouple intimately associated therewith, said plane metal members comprising respective first and second discs, said first disc, located at the end of the housing, being of a smaller diameter than said second disc, spaced axially inwardly thereof, whereby substantially all of the axial component of heat transferred inwardly of the housing from said first disc is received on said second disc.

3,908,460

PRESSURE TRANSDUCER

Abraham Lichowsky, Los Angeles, Calif., assignor to Ambitex Corporation and Cendev Corporation, Ambitex Company, Santa Monica, Calif.

Filed Feb. 28, 1974, Ser. No. 446,755
Int. Cl.² G01L *9/00*
U.S. Cl. 73—398 R **6 Claims**

1. A pressure transducer comprising, in combinoation:

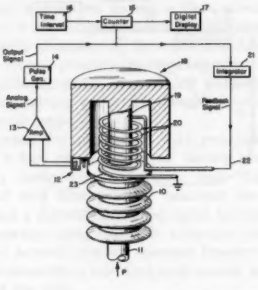
a. movable means responsive to a pressure to be measured, said movable means being capable of assuming different positions for different pressures;

b. analog signal generating means responsive to said movable means for generating an analog signal constituting a function of the position of said movable means;

c. pulse generating means including a voltage controlled oscillator connected to said analog signal generating means to receive said analog signal and provide an output series of pulses of frequency constituting a function of said analog signal;

d. counter means including a counter connected to receive said series of pulses; time interval generating means connected to said counter to actuate the counter for a given time interval; and a digital display connected to the counter to provide a digital reading corresponding to the number of counts counted by said counter during said given time interval to thereby provide an indication of the frequency thereof;

e. electro-magnetic means connected to said movable means; and



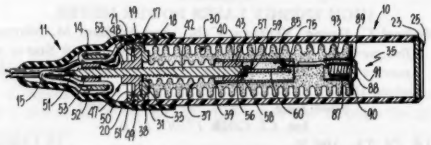
f. feedback means including an integrator receiving said series of pulses and providing a feedback signal to said electro-magnetic means derived from said analog signal to generate an electro-magnetic force opposing the direction of movement of said movable means whereby an equilibrium position is reached by said movable means, the frequency of said series of pulses constituting a function of the pressure opposing said electro-magnetic force when equilibrium is reached so that a pressure reading may be provided by properly calibrating the indicated frequency in terms of pressure.

3,908,461

ADJUSTABLE PRESSURE TRANSDUCER WITH DIGITAL SIGNAL OUTPUT

Oliver S. Turpen, Redwood City, Calif., assignor to Randtron Systems, Menlo Park, Calif.

Filed June 20, 1974, Ser. No. 481,082
Int. Cl.² G01L *9/02*
U.S. Cl. 73—398 AR **17 Claims**



1. A pressure transducer assembly for indicating ambient pressure over a predetermined differential pressure range having a minimum and a maximum and operable over a wide range of absolute pressures, said assembly comprising:

a housing having an interior;

means for communicating ambient pressure to said interior; and

means supported in said housing interior for generating discrete signals over said differential pressure range each representative of a different value of said ambient pressure, said generating means including means defining a protective enclosure for preventing contamination thereof;

said generating means including a multi-resistor assembly and a contact element, one of said multi-resistor assembly and said contact element being translatable relative to the other in response to changes in said ambient pressure;

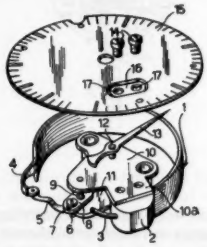
said multi-resistor assembly including an insulated substrate, a pair of spaced parallel rows of electrically conductive contact pads, the contact pads of one row being staggered relative to the contact pads in the other row, and a plurality of resistive elements connected to contact pads in said pair of rows to provide a series resistance network;

said contact element having a pair of spaced contact arms, each said arm being arranged for contact with individual pads of a different row.

3,908,462
BOURDON TUBE TYPE PRESSURE MEASURING INSTRUMENT

Carlo Alinari, Corso Vittorio Emanuele 200, Turin, Italy

Filed Nov. 23, 1973, Ser. No. 418,456
Claims priority, application Italy, Nov. 28, 1972, 70737/72
Int. Cl.² G01L 7/04
U.S. Cl. 73—418 **4 Claims**



1. Bourdon tube pressure gauge of the type comprising a Bourdon tube with a tubular and elastic element having a curved axis and an elliptical cross section, one end of which is connected to a carrier frame having an upper and lower plate while the other end actuates a kinematic arrangement which transmits a rotary motion to a pointer cooperating with a dial and an evacuation tube, characterized in that said evacuation tube and a metal bracket shaped to be inserted into the fixed end of the Bourdon tube one side of said metal bracket being integral with the frame supporting the mobile members and the other is shaped to be inserted in said tubular element, together with said evacuation tube with said tube and said bracket being welded to said Bourdon tube.

3,908,463
SAMPLE TRANSFER VALVE

Alfred Bedo, Walton Hills, and Edward Beck, Cleveland Heights, both of Ohio, assignors to Sno-Trik Company, Solon, Ohio

Filed Mar. 4, 1974, Ser. No. 447,859
Int. Cl.² G01N 1/10
U.S. Cl. 73—422 GC **9 Claims**

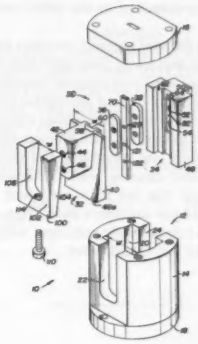
1. A sampling valve comprising:

a housing including a receiving cavity therein defined by rigid side walls;

a pair of body sections mounted in opposed relationship in said housing cavity, said body sections defining generally opposite sides of an elongated valve chamber with each body section having at least first and second flow passages which intersect said valve chamber;

an elongated valve member slidably received in said valve chamber, said valve member having at least a first orifice and a second orifice formed therethrough, said first and second orifices being located such that when said valve member is in a first position said first orifice connects said first flow passages and said second orifice connects said second flow passages;

means for moving said valve member from said first position to a second position to move said second orifice from connecting relationship with said second flow passages into connecting relationship with said first flow passages whereby a sample of fluid flow through said second flow



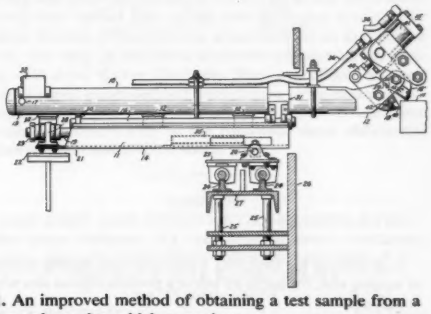
passages can be transferred to said first flow passages; and,

wedge means disposed in said cavity and positioned between and in engagement with one of said body sections and a rigid side wall of said housing for producing relative movement between said body sections to vary their force of engagement with said valve member.

3,908,464
HOT BILLET SAMPLER

Dean A. Flinchbaugh, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 8, 1974, Ser. No. 431,815
Int. Cl.² G01N 1/04
U.S. Cl. 73—424 **6 Claims**



1. An improved method of obtaining a test sample from a hot metal member which comprises:

a. providing a sampling tool having a pair of coacting jaw members including cutting bits mounted thereon,

b. engaging an edge of said hot metal member between said jaw members while said jaw members are open, and

c. causing said coacting jaw members to close toward each other to cut a test sample from said hot metal member.

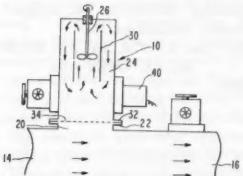
6. Apparatus for taking a test sample from a hot metal billet or the like comprising:

a. a support member,

b. a pair of coacting jaw members pivotally mounted on said support,

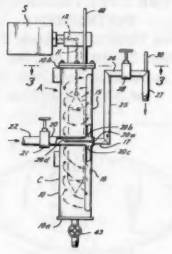
c. a substantially U-shaped jaw bit removably attached at one end of each jaw member such that when said jaw members are closed the cutting edges of the jaw bits do not contact each other,
d. toothed edge portions on each jaw member adapted for meshing during movement of said jaw members to insure alignment of said jaw bits,
e. a power cylinder pivotally attached to the other end of one of said jaw members with the piston rod of said power cylinder pivotally attached to the other end of the other jaw member,
f. first track means for said support member to slide said jaw members toward and away from said hot metal billet,
g. second track means for said support member to slide said jaw members laterally of said hot metal billet, and
h. means to supply power to said power cylinder when said jaw members are in contact with an edge of said hot metal billet to close said jaw members and cut into said hot metal billet without causing contact between the cutting edges of said jaw bits but to a sufficient depth so that movement of said jaw members away from said hot metal billet removes a substantially spherical wedge shaped test sample from said hot metal billet.

3,908,465
PARTICLE SIZE ANALYZER
Robert W. Bartlett, Palo Alto, Calif., assignor to Board of Trustee of Leland Stanford Jr. University, Stanford, Calif.
Filed Feb. 25, 1974, Ser. No. 445,197
Int. Cl.² G01N *15/02*
U.S. Cl. 73—432 PS **8 Claims**



1. A method for analyzing a slurry stream, having particles of varying size, for particles below a predetermined size which comprises:
directing a first sample slurry stream having particles in a range of sizes past and in contact with a perforated barrier having openings of a size intermediate the size range of said particles in said first slurry stream;
directing a second reference slurry stream past and in contact with the opposite side of said perforated barrier having particles of a size at and below the openings in said perforated barrier;
measuring the pulp density of said first and second slurry streams; and
determining the mass fraction of particles at and below said predetermined size in said first slurry stream from the pulp density determinations of said first and second slurry streams.

3,908,466
MUD WEIGHING UNIT
Leo A. Bell, Santa Ana, Calif., assignor to Martin-Decker Company
Filed Nov. 5, 1973, Ser. No. 412,769
Int. Cl.² G01N *9/00*
U.S. Cl. 73—45 L **7 Claims**



1. A drilling mud weighing unit, comprising:
a chamber adapted to receive mud therein and having an upper end, a lower end, a chamber side wall between said ends, an upper inlet and a lower inlet with an outlet midway between said inlets for the flow of mud therethrough;
mud level control means communicating with said chamber and the atmosphere exterior thereto for maintaining said chamber full of mud and degassing means at the upper end of the chamber for degassing the mud to prevent collecting gas in said chamber;
a float suspended in said chamber for buoyant response to variations in the density of the mud in said chamber;
said upper inlet being through said side wall and below said upper end of said chamber;
said lower inlet being through said side wall and above said lower end of said chamber;
said inlets being disposed for directing incoming mud in a substantially tangential direction relative to said side wall of said chamber for causing circular mud flow completely around said float from each of said inlets to said outlet for substantially equalizing the mud forces acting on said float therearound and for its full length, whereby channeling of the mud flow is prevented and thereby erratic inaccurate responses by said float are inhibited;
a common inlet pipe externally of said chamber connected to said inlets;
divider means in said common inlet for substantially equally dividing the inlet flow of mud to said inlets to thereby substantially equalize the longitudinal flow forces acting on said float as the mud flows through said chamber;
a sensing unit connected to said float for sensing changes in buoyancy of said float in response to variations in the density of the mud in said chamber; and
said float being disposed substantially midway between said upper inlet and said lower inlet so that mud flow in said chamber is in opposite longitudinal directions relative to said float and towards said outlet for minimizing flow effects of the mud on said float.

3,908,467

DENSITY MEASURING APPARATUS, WITH PLURALITY OF PIVOTED FLOAT INDICATORS OF DIFFERING BUOYANCIES

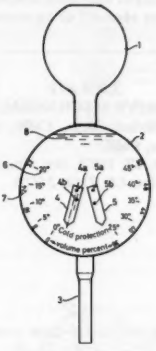
Roland Schwen, Friedelsheim, and Theodor Weber, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 23, 1973, Ser. No. 418,306

Claims priority, application Germany, Nov. 25, 1972, 2257924

Int. Cl.² G01N 9/00

U.S. Cl. 73—454 13 Claims



1. Apparatus measuring the density of liquid materials and particularly for measuring the density of aqueous antifreeze solutions, for example on the basis of ethylene glycol, according to the Archimedes Principle, consisting of a transparent measuring vessel equipped with suction means, a plurality of buoyant elements with associated scales, preferably for the antifreeze content in the solution, each buoyant element is in the form of a lever of uneven mass distribution movably mounted on a substantially horizontal axis so that its free end describes a circular path, said elements being of different buoyancies, wherein the density-dependent coefficient of expansion of the liquid being measured is taken into account over the range of measurements to be carried out.

3,908,468

STORAGE TANK LEAK DETECTOR

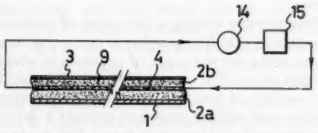
Kihei Katsuta, Nagasaki, and Chiaki Matsuyama, Tokyo, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Mar. 11, 1974, Ser. No. 450,238

Claims priority, application Japan, Mar. 17, 1973, 48-31188

Int. Cl.² G01M 3/16

U.S. Cl. 73—49.2 5 Claims



1. A storage tank for a low-temperature liquid comprising a tank shell, a heat insulation layer with which the tank shell is lined, a liquid-impervious layer sandwiching the heat insulation layer between itself and the tank shell and serving as a first barrier, a second barrier provided inside the heat insulation layer, and a lamination extended along the inner side of the second barrier and including a capacitor layer which in turn consists of at least two electrically conductive layers and an electrical insulation layer interposed therebetween, said electrically conductive layer provided inwardly of the electrical insulation layer being formed with a multiplicity of fluid passages, so that any leakage of the low-temperature liquid through the lining is detected from a change in the capacity meter reading of the capacitor layer with the penetration of the leaking liquid into the electrical insulation layer by way of the fluid passages.

3,908,469

ROTATIONAL SPEED MEASURING DEVICE, PARTICULARLY FOR ROTARY CASTING INSTALLATIONS AND THE LIKE

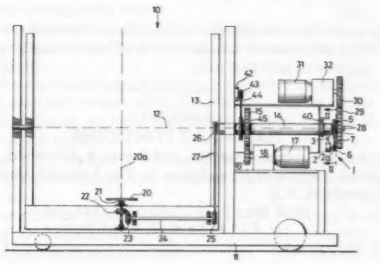
Eugen Reinhardt, Villingen, Germany, assignor to Ernst Reinhardt GmbH, Villingen, Germany

Filed Feb. 11, 1974, Ser. No. 441,515

Claims priority, application Germany, Feb. 13, 1973, 2306905

Int. Cl.² G01P 3/04, 3/44

U.S. Cl. 73—507 7 Claims



1. A device for measuring the speed about a measuring axis of a machine element such as a form carrier plate for a rotary casting installation; comprising means for imparting rotation to said carrier plate about two mutually angularly inclined axes, one of said inclined axes being said measuring axis, said means including separate controllable drive arrangements having coaxially rotatable drive shafts, one of said drive shafts driving said carrier plate about said measuring axis; a drive system through which said one drive shaft drives said carrier plate, the other of said drive shafts driving said carrier plate and said drive system about the other one of said inclined axes; a signal generator and transmission drive means transmitting a rotational speed measuring parameter to said signal generator proportionate to the rotational speed differential between said coaxial drive shafts.

3,908,470

LOW COST, LOW PRESSURE GAS BEARING GYRO

John Evans, Oakland, N.J., and Murray Hefter, Rockaway, N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 5, 1973, Ser. No. 412,711

Int. Cl. G01c 19/28

U.S. Cl. 74—5.6 D 16 Claims

1. A gyroscope unit comprising:

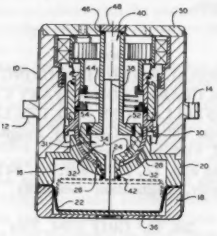
a. a stator element defining a cavity;

b. a rotor element mounted within said cavity for rotation about a first axis with respect to said stator when supported by a pressurized gas;

c. means defining an enclosed gas filled chamber having a wall portion movable from a first to a second position to substantially reduce the volume of said chamber thereby compressing the gas therein and increasing the internal pressure from a first value equal to atmospheric pressure to a second value;

d. means permitting communication between said gas filled chamber and said cavity whereby when said internal pressure is increased to a second value said increased pressure at a second value will be present in said cavity to support said rotor element;

e. a pyrotechnic squib arranged to move said wall portion from said first to said second position when actuated;



f. means for imparting rotation to said rotor about said first axis;

g. means for sensing relative movement between said rotor and stator about second and third axis mutually perpindicular to said first axis.

3,908,471

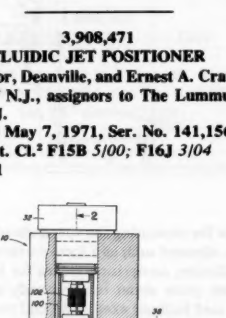
FLUIDIC JET POSITIONER

Ward F. O'Connor, Deanville, and Ernest A. Crawford, Ridge Wood, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed May 7, 1971, Ser. No. 141,156

Int. Cl.[2] F15B *5/00*; F16J *3/04*

U.S. Cl. 74—18.1 **1 Claim**



1. A low friction position controller for use within a pressure chamber comprising:

a lever arm extending from the exterior of said chamber to the interior thereof through an opening in said chamber; bellows means disposed inside said chamber for sealing said lever arm to said chamber;

a fixed bracket member rigidly mounted within said chamber, said fixed bracket member having top, side and bottom portions;

a movable bracket member having top, side and bottom portions, said top portion of said movable bracket member being rigidly secured to said lever arm;

tension flexure means mounted inside said chamber for supporting said lever arm and allowing movement thereof in a single plane only about an axis of rotation defined by said tension flexure means, said tension flexure means comprising a first pair of substantially parallel wires secured to and extending between the side portions of said fixed and movable bracket members, said wires of said first pair being disposed substantially perpendicular to, equidistant from and on opposite sides of said lever arm and a second pair of substantially parallel wires secured to and extending between the top portion of said fixed bracket member and the bottom portion of said movable bracket member, said wires of said second pair of wires being disposed substantially parallel to, equidistant from and on opposite sides of said lever arm, and said first pair of wires being disposed in substantially perpendicular relationship to said second pair of wires such that said common axis of said pairs of wires defines the axis of rotation of said lever arm; and

means linking the end of said lever arm within said chamber with the operative element to be controlled.

3,908,472

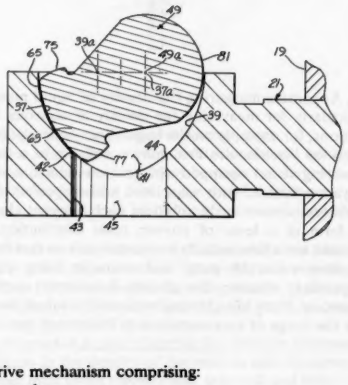
DRIVE MECHANISM

Walter E. Cover, Mission Viejo, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Sept. 27, 1973, Ser. No. 401,246

Int. Cl. F16h *21/16*

U.S. Cl. 74—25 **14 Claims**



1. A drive mechanism comprising:

a first member;

means for mounting said first member for movement along a first path;

a second member;

means for mounting said second member for movement along a second path;

first surface means defining a first cavity in said second member;

second surface means defining a second cavity in said second member, said second cavity opening into said first cavity;

said first member having a first range of positions in which a section of said first member is receivable in said second cavity and a second range of positions in which at least a portion of said first member is received in said first cavity; said section of said first member being cooperable with said second surface means to provide a driving connection between said members in said first range of positions whereby one of said members can drive the other of said members;

said first surface means being cooperable with said first member to substantially prevent movement of said second member along the path thereof in said second range of positions; and

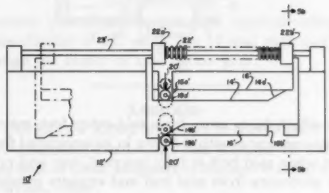
at least one of said paths being arcuate.

3,908,473

LINEAR MOTION SNAP-ACTION MECHANISM

Michael Robert Bussen, Arnold, and Gary Lee Schurter, St. Louis, both of Mo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 9, 1974, Ser. No. 432,065
Int. Cl.[2] F16H 21/44, 21/54, 25/18
U.S. Cl. 74—100 R 6 Claims



1. A linear motion snap-action mechanism comprising, in combination:

a reference frame having a given longitudinal dimension, and said frame having at least one pair of carrier slots therein, with each carrier slot being provided along a generally lateral dimension;

first and second detent members respectively disposed and moveably mounted in said carrier slots each of said detent members including roller bearing means and each detent member being independently movable relative to the other of said detent members;

spring bias means for urging said first and second detent members respectively toward one end of the corresponding carrier slot;

an input arm slidably mounted about said frame for translation in said given longitudinal dimension, said input arm having first and second cam members, said cam members being spaced from one another along said given longitudinal dimension, and each cam member being adapted to engage the roller bearing means of one of said detent members in rolling friction engagement therewith thereby to move one of said first and second detent members away from said one end of said corresponding carrier slot as said input arm is translated into a corresponding position;

an output arm slidably mounted about said frame for translation in said given longitudinal dimension, said output arm having first and second detent slots, said detent slots being spaced from one another along said given longitudinal dimension, said first detent slot receiving said first detent member when said output arm is at a first position and said first detent member is urged toward said one end of said corresponding carrier slot, and said second detent slot receiving said second detent member when said output arm is at a second position and said second detent member is urged toward said one end of the other carrier slot; and

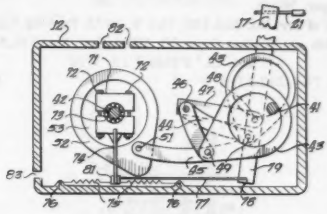
a storage spring disposed between said input and output arms wherein said storage spring is compressed when said input arm is translated away from said output arm and wherein said output arm is translated back toward said input arm by the energy stored in said storage spring when either one of said cam members engages and moves said one of said first and second detent members.

3,908,474

BICYCLE IMPROVEMENT THROUGH PROVISION OF AN AUTOMATIC TRANSMISSION

Eli Wm. Cole, 1206 W. Foster Ave., Chicago, Ill. 60640

Filed Oct. 23, 1973, Ser. No. 408,917
Int. Cl. F16h 29/04
U.S. Cl. 74—117 4 Claims



1. In a bicycle including

a hand control means mounted on a handlebar of the bicycle having pedal means,

a non-stepped, continuously variable transmission means having a control member connected to said hand control means,

said transmission means having a rotatable input shaft and a rotatable output shaft, the ratio of rotation of the two shafts being continuously variable upon movement of said control member,

a first drive means for driving the input shaft, said first drive means connecting said pedal means and said input shaft, and

a second drive means for driving a wheel connected to a hub of the bicycle, said second drive means connecting said output shaft and said hub

the improvement consisting of the inclusion of

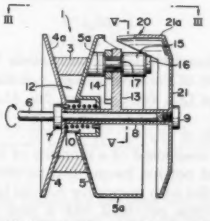
a governor means for automatically adjusting the variable ratio of the transmission in response to the forward speed of said bicycle.

3,908,475

CENTRIFUGALLY CONTROLLED EXPANSIBLE PULLEY WITH TORQUE CAM ACTUATION

Izumi Takagi, and Shigeo Adachi, both of Akashi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Aug. 26, 1974, Ser. No. 500,521
Claims priority, application Japan, Sept. 1, 1973, 48-98715
Int. Cl.[2] F16H 55/52; F16D 43/06
U.S. Cl. 74—230.17 E 6 Claims



6. Pulley assembly for a V-belt type transmission comprising a stationary pulley element secured to a shaft and a movable pulley element movable along and rotatable about the shaft, said stationary and movable elements defining a V-shaped circumferential groove therebetween, torsional spring means associated with the movable element for biasing it in one angular direction, centrifugal means for angularly urging the movable element against the influence of the torsional spring means in accordance with the speed of the shaft, and cam

means for axially displacing said movable element in accordance with angular displacement of the movable element with respect to the stationary element.

3,908,476

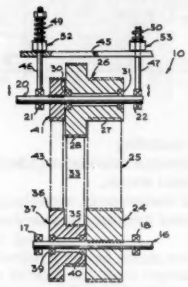
BELT DRIVE AND TENSIONING APPARATUS

Henry Folkert, Granger, Wash., assignor to Folkert, Inc., Granger, Wash.

Division of Ser. No. 404,188, Oct. 9, 1973, Pat. No. 3,853,018. This application Sept. 30, 1974, Ser. No. 510,541

Int. Cl.² F16H *7/12, 7/10*

U.S. Cl. 74—242.11 A **5 Claims**



1. An automatic belt tensioner for a compact belt drive transmission in which a first shaft rotatably journaled by first support means affixed to a frame means fixedly carries a first belt pulley and a second shaft rotatably journaled by second support means and disposed in a spaced and generally parallel relationship to said first shaft fixedly carries a second belt pulley and belt means operatively connects said pulleys, said tensioner comprising:

at least one elongated member for attaching said second support means to said frame means in a generally planar alignment with said belt means and extending in an opposite direction thereto;

spring bias means affixed to said elongated member and urging said member upwardly with a force sufficient to maintain proper tension on said belt means irrespective of wear and stretching of said belt means when the transmission is at rest; and

stop means cooperatively engaging said elongated member preventing said member from moving downward when the transmission is operative and a downward force greater than the force of said spring bias means is applied to said second shaft.

3,908,477

LINK CHAIN

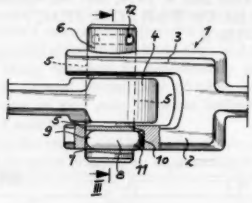
Fritz Teske, Industriestrasse 28, and Lothar Teske, Industriestrasse 30, both of Porz-Westhoven, Germany

Filed Oct. 11, 1974, Ser. No. 514,278

Int. Cl.² F16C *11/04*

U.S. Cl. 74—251 R **7 Claims**

1. In a chain composed of a plurality of links including: at least one forked portion having two parallel extending fork members provided with respective coaxial bores, at least one bearing eye portion provided with a bore coaxial with the bores in the forked portion, and a chain bolt extending through the bores in the forked portions and the bearing eye portion to hold those portions together, the chain bolt being secured against axial displacement and rotation relative to the forked portion, the improvement wherein: said chain bolt is provided at one of its ends with a through hole whose axis is transverse to the axis of said bolt; said chain bolt comprises a pin inserted in said hole in an axially displaceable manner and having a length greater by one-half its diameter than the axial length of said through hole; said fork member which is adjacent the end of said bolt provided with said through hole is formed with a recess which extends to that surface of said fork



member which faces away from said other fork member and which communicates with the bore in its associated fork member; and when said bolt is fully inserted, one end portion of said pin protrudes from said bolt and engages in said recess.

3,908,478

STEERING ARRANGEMENT FOR MOTOR VEHICLES

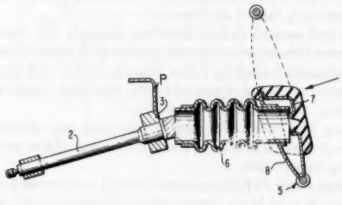
Béla Barényi, Maichingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 23, 1973, Ser. No. 344,100

Claims priority, application Germany, Mar. 24, 1972, 2214417

Int. Cl.² B62D *1/18*

U.S. Cl. 74—492 **12 Claims**



1. A steering arrangement for motor vehicles with a steering spindle means which is connected to a steering wheel by way of deformation means, the steering wheel including steering wheel rim means, characterized in that the steering wheel rim means is disposed in a plane perpendicular to the axis of the steering spindle, and in that the axis of the deformation means along the entire length thereof between the steering wheel and the steering spindle means extends horizontally in a normal zero position of the steering wheel, and in that the deformation means is non-guided in the horizontal direction in the zero position.

3,908,479

VARIABLE RATIO RACK AND PINION POWER STEERING GEAR

Stanley I. MacDuff, P.O. Box 1525, Daytona Beach, Fla. 32015

Filed Dec. 10, 1973, Ser. No. 423,106

Int. Cl.² B62D *1/20;* **F16H** *35/00;* **F15B** *9/10*

U.S. Cl. 74—498 **12 Claims**

1. A vehicle steering gear comprising:

a housing having walls;

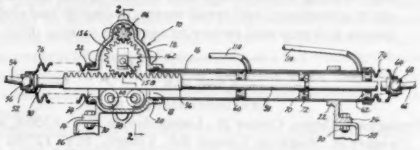
a pinion gear rotatable in said housing;

a rack spaced from the pinion gear and slidable in said housing; and

a ratio changing gear positioned between the rack and the pinion gear, said ratio changing gear having

an eccentric pin, and

means in engagement with said housing to constrain said



eccentric pin to move in a path approximating a line perpendicular to the pitch line of said rack and passing through the center of said pinion gear.

3,908,480

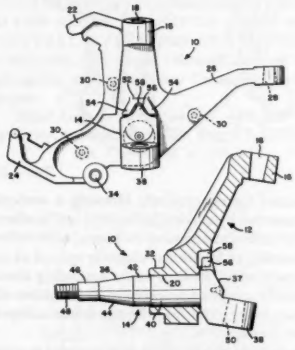
INTERLOCKING KNUCKLE ASSEMBLY

Carlos P. Afanador, Centerville, and Richard G. Tschabrun, Dayton, both of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 297,222, Oct. 13, 1970, Pat. No. 3,801,124. This application Feb. 7, 1974, Ser. No. 440,297

Int. Cl. G05g *1/08*

U.S. Cl. 74—511 6 Claims



1. In a knuckle assembly including an integrally formed casting, a first knuckle boss formed integrally with and projecting from said casting, means defining a spindle receiving opening formed through said casting in spaced relationship to said first knuckle, an integral forging consisting of a spindle shaft and a second knuckle boss formed integrally with said spindle shaft, and wherein said spindle shaft is received in said spindle receiving opening and fixed therein with the wall of said opening engaging a section of said spindle shaft and said second knuckle boss is positioned in opposition to said first knuckle boss, improved means for preventing rotational movement of said spindle shaft within said opening and misalignment of said first and second knuckle bosses with respect to each other comprising:

a. first interlocking means formed integrally with said casting outwardly of said spindle receiving opening therein,

b. second interlocking means complementary to said first interlocking means and formed integrally with said forging,

c. said second interlocking means being formed on a surface of said forging other than said section thereof engaged by said wall of said opening, and

d. said first and second interlocking means being in engagement with each other outwardly of said spindle receiving opening with said first and second knuckle bosses positioned in opposition to each other.

3,908,481

DEVICE FOR ROTARY LATCHING AND UNLATCHING

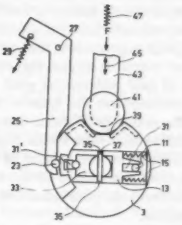
Kurt Eisemann, Berlin, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 28, 1973, Ser. No. 401,720

Claims priority, application Germany, Oct. 13, 1972, 2250179

Int. Cl.² G05G *5/06*

U.S. Cl. 74—527 6 Claims



1. A device for rotating a switching member and for automatically releasing the member from a latched position, comprising a switching member mounted for rotation about an axis and having a first curved track surface, means for mounting a spindle for rotation about said axis, means for actuating said spindle, latching means connected to said switching member, having a second curved track surface for movement from a normal position in which said second curved track surface and said first curved track surface constitute a discontinuous track having latching cavities to an unlocked position in which said first and second surfaces form a continuous curved track surface, said device further comprising means for biasing said latching means from said unlocked toward said normal position, and means coupling said spindle to said latching means for rotating said switching member in response to rotation of said spindle when said member is free to rotate and for transmitting force to overcome said biasing means and moving said latching means from said normal to said unlocked position when latching engagement of said switching member by a control member prevents rotation of said switching member.

3,908,482

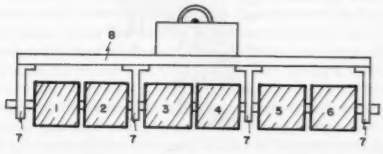
COAXIAL GEAR SYSTEM FOR BELLYLESS VEHICLES

Paul Kehler, 17305 Fergus Dr., South Bend, Ind. 46635

Filed Mar. 7, 1974, Ser. No. 448,957

Int. Cl. F16h *37/06, 1/38;* B62d *11/00*

U.S. Cl. 74—675 10 Claims



1. A coaxial gear system for bellyless vehicles, said bellyless vehicles comprising two outer tracks or two outer rows of wheels and a multiplicity of inner tracks or a multiplicity of inner rows of wheels, said outer tracks or outer rows of wheels being directly and independently powered by the power plant of said bellyless vehicle, and said inner tracks or inner rows of wheels being individually powered by the differential gear trains comprising said coaxial gear system in such a manner that each inner track or each inner row of wheels rotates at an angular speed that is intermediate the angular speeds of its two adjacent tracks or rows of wheels.

2. A coaxial gear system for bellyless vehicles according to claim 1, said coaxial gear system comprising a set of differentials capable of gradual and uniform differentiation between the speeds of two independent inputs,

said set of differentials comprising a coaxially mounted multiplicity of differential gear trains,

said differential gear trains comprising two input gears and one output gear that rotates at a speed that is intermediate the speeds of said two input gears,

said two independent inputs to said set of differentials being applied to the two outer input gears of the two outer differential gear trains of said set of differentials,

said differentiation of speeds being caused by an interconnection of said input gears and said output gears of said differential gear trains in such a manner that the output gears of each of said differential gear trains rotate at a speed that is intermediate the speeds of the output gears of the two differential gear trains mounted adjacent to each of said differential gear trains mounted adjacent to each of said differential gear trains or rotate at a speed that is intermediate the speeds of the output gear of the only adjacent differential gear train and of one of said two independent inputs,

said interconnection of said gears being accomplished by connecting said output gears of each of said differential gear trains to input gears of its adjacent differential gear trains or gear train, and by connecting said input gears of each of said differential gear trains to the output gears of its two adjacent differential gear trains or to the output gear of its only adjacent differential gear train and to one of said two independent inputs.

3,908,483

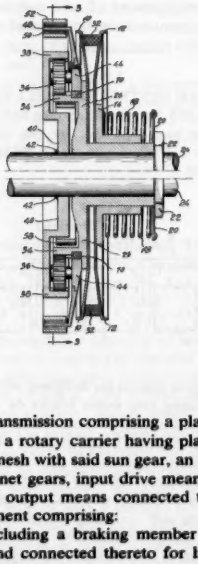
PLANETARY REVERSE TRANSMISSION

Gerald Piquette, 295, St.-Cyrille, C.p. 384, Normandin, Province de Quebec, Canada

Continuation-in-part of Ser. No. 325,152, Jan. 9, 1973, abandoned. This application Sept. 17, 1973, Ser. No. 397,647

Int. Cl.[2] F16H *3/44*; F16D *23/10*, *11/00*

U.S. Cl. 74—792 **6 Claims**



1. In a power transmission comprising a planetary gear set having a sun gear, a rotary carrier having planet gears journalled thereon in mesh with said sun gear, an internal gear in mesh with said planet gears, input drive means connected to said sun gear, and output means connected to said internal gear, the improvement comprising:

brake means including a braking member rotatable with said carrier and connected thereto for limited rotation relative to said carrier;

releasable clutch means normally drivingly connecting said sun gear to said carrier for forward drive; and

means responsive to said limited relative rotation between said braking member and said carrier in one direction, upon actuation of said brake means, to disable said clutch means and stop said carrier to establish reverse drive.

3,908,484

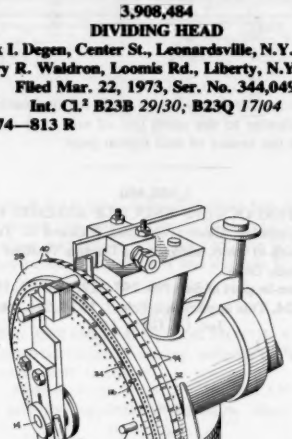
DIVIDING HEAD

Frederick I. Degen, Center St., Leonardsville, N.Y. 13364, and Gregory R. Waldron, Loomis Rd., Liberty, N.Y. 12754

Filed Mar. 22, 1973, Ser. No. 344,049

Int. Cl.[2] B23B *29/30*; B23Q *17/04*

U.S. Cl. 74—813 R **15 Claims**



1. Apparatus for successively indexing a workpiece when rotatably mounted by a swing increment into a selected one of a plurality of different arrays of locations, each different array having a plurality of locations relatively spaced at equal intervals from each other about a circle extending about the axis of the rotatably mounted workpiece, the number of locations of each array being different, the apparatus comprising:

a. a support member,

b. a shaft rotatably mounted on said support member,

c. means mounted on said shaft for removably grasping the workpiece for rotational movement with said shaft,

d. means connected to the support member for selectively preventing rotation of said shaft and the workpiece,

e. first means movably mounted on the shaft for establishing a first predetermined angular displacement of said shaft about its axis of rotation, the first predetermined angular displacement corresponding to a first predetermined fraction of a full circle, the denominator of the first predetermined fraction being relatively prime,

f. second means movably mounted on the shaft for establishing a second predetermined angular displacement of said shaft about its axis of rotation, the second predetermined angular displacement corresponding to a second predetermined fraction of a full circle which is different from the first, the denominator of the second predetermined fraction being relatively prime,

g. means mounted on the first and second means for defining an intermediate predetermined angular displacement of said shaft about its axis of rotation which is equal to the sum of the first predetermined angular displacement and the second predetermined angular displacement, the numerators of the first predetermined fraction and the second predetermined fraction when selected from one of plurality of predetermined combinations thereof enabling one of a plurality of intermediate predetermined angular displacements to be achieved which are used to enable a full circle

to be divided into a predetermined number of equal segments,

h. third means movably mounted on the shaft for establishing a third predetermined angular displacement of the shaft about its axis of rotation, the third predetermined angular displacement corresponding to one of a preselected equal increment of angular displacement of a full circle and being a function of the number of locations to be disposed between successive locations to which the workpiece is indexed,

i. additional means mounted on the third means for defining a total predetermined angular displacement of said shaft about its axis of rotation which is equal to the sum of the third predetermined angular displacement and the intermediate predetermined angular displacement, the total predetermined angular displacement including the number of locations to be skipped between locations at which the workpiece is to be indexed; and

j. means connected to the support member for controlling the rotation of said shaft through angular displacement of the shaft about its axis of rotation which is equal to the total predetermined angular displacement,

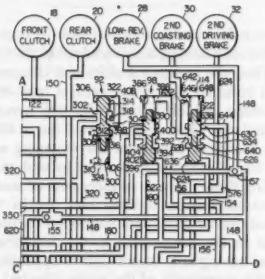
whereby the workpiece can be indexed through a precisely governed angular displacement by the swing increment determined by the total predetermined angular displacement.

3,908,485

AUTOMATIC POWER TRANSMISSION CONTROL SYSTEM FOR REDUCING SHOCKS WHEN SHIFTING FROM NEUTRAL TO REVERSE DRIVE CONDITIONS

Toshiyuki Miyauchi, and Kunio Ohtsuka, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Aug. 8, 1974, Ser. No. 495,922
Claims priority, application Japan, Aug. 17, 1973, 48-91778
Int. Cl.² B60K *41/06*
U.S. Cl. 74—867 **6 Claims**



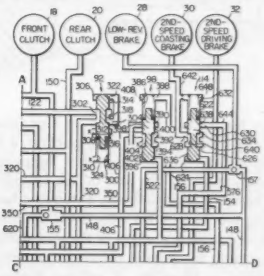
1. An automatic power transmission which consists of a transmission mechanism for selectively producing any of a multiplicity of forward-speed gear ratios and a reverse-speed gear ratio and a hydraulic control system for hydraulically controlling the transmission mechanism, the hydraulic control system comprising a source of line pressure, a throttle valve responsive to load on an engine connected to the transmission mechanism for producing from the line pressure a throttle pressure which varies with the engine load, a governor valve responsive to vehicle speed for producing from the line pressure a basic governor pressure which varies with the vehicle speed, a hysteresis valve for producing from the line pressure a substantially constant hysteresis pressure which is higher than the governor pressure, a pressure regulator valve which has a first fluid port constantly in communication with the source of the line pressure, a second fluid port for being open to communicate with the source of the line pressure during forward drive condition of the vehicle, a third fluid port which is in constant communication with the throttle valve and a fourth fluid port to selectively communicating with the source of the line pressure or the hysteresis valve over a first tow-position valve which is operative to pass therethrough the line pressure in the presence of the line pressure therein during the forward drive condition or the hysteresis pressure in the absence of the line pressure therein, whereby the pressure regulator valve is acted upon by: the line pressure in the first, second and fourth fluid ports and the throttle pressure in the third fluid port for maintaining the line pressure at a first level during the forward drive condition of the vehicle; the line pressure in the first fluid port and the throttle pressure in the third fluid port during reverse drive condition of the vehicle; and the line pressure in the first fluid port, the throttle pressure in the third fluid port and the hysteresis pressure in the fourth fluid port for maintaining the line pressure at a second level lower than the first level during idling under the reverse drive condition of the vehicle.

3,908,486

HYDRAULIC CONTROL SYSTEM OF AN AUTOMATIC POWER TRANSMISSION

Kenichi Mitamura; Kunio Ohtsuka, both of Yokohama, and Toshiyuki Miyauchi, Kamakura, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Aug. 30, 1974, Ser. No. 502,299
Claims priority, application Japan, Oct. 18, 1973, 48-116297
Int. Cl.² B60K *41/06, 41/18*; F16H *3/74*
U.S. Cl. 74—869 **5 Claims**



1. A hydraulic control system of an automatic power transmission for selectively producing a multiplicity of forward-speed gear ratios and a reverse-speed gear ratio, comprising a source of line pressure, a throttle valve responsive to load on an engine for producing from the line pressure a throttle pressure related to the engine load, a governor valve responsive to vehicle speed for producing from the line pressure a governor pressure related to the vehicle speed, a hysteresis valve for producing from the line pressure a substantially constant hysteresis pressure which is higher than said governor pressure, a kick-down valve communicating with said throttle valve and operative to pass therethrough the hysteresis pressure when the throttle pressure is increased to a level substantially representative of kick-down condition of the engine, and a plurality of shift valves each having a downshift position and an upshift position, at least one of said shift valves having first differential pressure-acting areas and second differential pressure-acting areas and formed with a first fluid port to communicate with said source of line pressure during automatic drive range condition of the transmission, the line pressure in the first fluid port acting upon the first differential pressure-acting areas for urging the shift valve toward the downshift position when the shift valve is in the downshift position, the line pressure in the first fluid port being isolated from the first differential pressure-acting areas when the shift valve is in the upshift position, a second fluid port which is in constant communication with said throttle valve, the throttle pressure in the second fluid port urging the shift valve toward the downshift position, a third fluid port communicating with said governor valve, the governor pressure in the third fluid port urging the shift valve toward the upshift position, a fourth

fluid port in constant communication with said hysteresis valve and located to be closed when the shift valve is in the upshift position, the hysteresis pressure in the fourth fluid port acting upon said second differential pressure-acting areas for urging the shift valve toward the downshift position when the shift valve is in the downshift position, and a fifth fluid port communicating with said kick-down valve and located to be closed when the shift valve is in the downshift position, the hysteresis pressure passed through the kick-down valve to the fifth fluid port acting upon the second differential pressure-acting areas for urging the shift valve toward the downshift position when the shift valve is in the upshift position.

3,908,487

ROTARY HAND TOOL

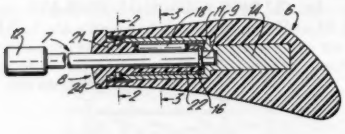
Graeme Raymond Plaw, Nunawading, Australia, assignor to The Stanley Works, New Britain, Conn.

Continuation of Ser. No. 286,342, Sept. 5, 1972, abandoned. This application May 6, 1974, Ser. No. 466,970

Claims priority, application Australia, Sept. 10, 1971, 6254/71

Int. Cl.² B25B *13/46, 15/04;* B60M *1/24*

U.S. Cl. 81—59.1 **4 Claims**



1. A rotary hand tool comprising an elongated tool shank with a generally cylindrical coupling portion, a longitudinally extending operating handle assembly supporting the tool shank for rotation about the axis of the cylindrical coupling portion and having a longitudinally extending handle member and a coupling mechanism for selectively coupling the handle member to said coupling portion of the tool shank for rotating the tool shank with the handle member, the coupling mechanism comprising a plurality of rolling elements angularly spaced about said generally cylindrical coupling portion of the tool shank and in rolling contact therewith, a longitudinally extending rigid cast housing mounted in the handle member having an axially extending generally polygonal bore, a generally polygonal hard thin metal tubular liner of generally constant wall thickness throughout its extent conforming to and secured within the generally polygonal bore of the cast housing to define a generally polygonal chamber receiving the coupling portion of the tool shank, the generally polygonal bore having a generally polygonal cross-sectional configuration with a plurality of at least as many rounded concave corners as the number of rolling elements and the generally polygonal tubular liner having a corresponding plurality of rounded concave corners defining angularly spaced cavities about the coupling portion of the tool shank loosely receiving individual rolling elements therein and angularly spaced hard metal liner wedging surfaces for each rolling element extending generally tangentially from the respective rounded corner on opposite sides of the respective rolling element for selective engagement with the rolling element for wedging it against the generally cylindrical coupling portion of the tool shank, and rolling elements positioning means comprising a collar surrounding the elongated tool shank coaxially of the cast housing and the tool shank and having an outer end portion at an outer end of the cast housing bore and a tubular portion projecting from the outer end portion inwardly of the bore and the liner, said tubular portion being provided with detent means constantly interlocking the collar to the cast housing for rotating the collar with the housing, said detent means providing alternative first and second detent positions, said collar in its first detent position holding each rolling element relative to the respective liner wedging surfaces for rotating the tool shank with the handle member in a first angular direction only, said collar in its second detent position holding each rolling element relative to the respective liner wedging surfaces for rotating the tool shank with the handle member in the reverse angular direction only.

3,908,488

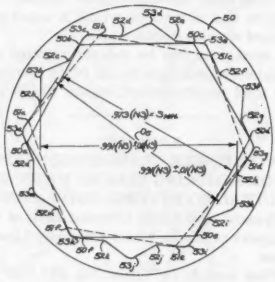
MINIMUM STRESSED WRENCH

Alfred Frederick Andersen, 2014 Los Angeles Ave., Berkeley, Calif. 94707

Filed Oct. 1, 1973, Ser. No. 402,620

Int. Cl.² B25B *13/06*

U.S. Cl. 81—121 R **4 Claims**



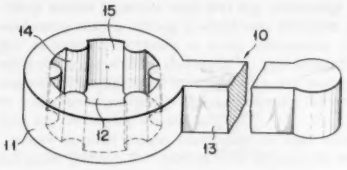
1. A wrench for turning a nut or bolt of regular polygonal shape, said wrench having a cavity of subsurfaces for engaging and turning said nut in either a clockwise or counterclockwise direction of rotation about the central axis of said regular polygonal shape, which subsurfaces are symmetrical with respect to said axis when engaging said nut in either direction of rotation, and at which times the engaging subsurfaces of said cavity are all essentially parallel to said axis, and where during turning there are one or more sets of such subsurfaces employed exclusively in turning said nut in the clockwise direction and one or more sets employed exclusively in turning said nut in the counterclockwise direction of rotation, each such set having at least one pair of opposing subsurfaces, and where the magnitude of the acute dihedral angle formed by the intersection of the plane of any subsurface for turning in clockwise rotation and the plane of that adjacent subsurface for turning said nut in counterclockwise rotation which engages the nut in the vicinity of the same vertex of the nut as said "any subsurface" is substantially greater than $360°/n$, where n is the number of sides in said polygonal shape, and where the perpendicular distance between any two opposing said subsurfaces of said wrench in any such set falls within the range from 0.01 of nominal below (that is, less than) nominal to 0.01 of nominal above (that is, greater than) nominal, thus making the range from 0.990 of nominal to 1.010 of nominal, when the nut to be turned is made of heated-treated and hardened steel; and falls within the range from 0.01 of nominal below 0.991 of nominal to 0.01 of nominal above 0.991 of nominal, thus making the range from 0.981 of nominal to 1.001 of nominal, when the nut to be turned is made of mild steel; and falls within the range from 0.01 of nominal below 0.982 of nominal to 0.01 of nominal above 0.982 of nominal, thus making the range from 0.972 of nominal to 0.992 of nominal, when the nut to be turned is made of soft metal, such as brass or aluminum.

3,908,489

FASTENER DRIVER

Kelichi Yamamoto, and Kozo Yamamoto, both of Tokyo, Japan, assignors to Yamamoto Byora Co., Ltd., Arakawa, Japan

Filed July 17, 1974, Ser. No. 489,366
Claims priority, application Japan, Nov. 30, 1973, 48-138208
Int. Cl.² B25B 13/06
U.S. Cl. 81—121 B 14 Claims



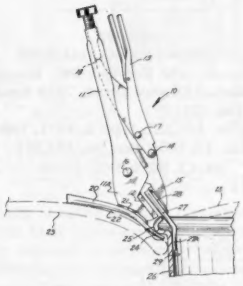
1. A fastener driver comprising a body having a fitting recess, said fitting recess having its inner periphery provided with a plurality of ribs and a plurality of engagement grooves defined between the respective adjacent ribs, said fitting recess forming a first circle at its cross section; each of said ribs forming at its cross section a partial circle bowed inside of the first circle; the center of the partial circle being situated on a corresponding radial line extending from the center of the first circle and within a range of said radial line defined between said latter center and a first intersection where two tangential lines intersect, said tangential lines being tangent to the first circle at second intersections respectively where the first circle intersects the partial circle, said partial circle of each said rib having a constant radius over the length of each said rib, and each rib extending in alignment with the generatrix of said inner periphery of said fitting recess.

3,908,490

HAND TOOL FOR MOUNTING TRUCK TIRES

Jerry L. Durham, 1175 W. 22nd, Eugene, Oreg. 97405

Filed Aug. 12, 1974, Ser. No. 496,866
Int. Cl.² B25B 7/02
U.S. Cl. 81—420 3 Claims



1. In combination with a plier-type tool having opposing jaws and locking means for retaining the jaws in clamped relationship, the improvement providing a tool temporarily attached to a vehicle wheel during the mounting of a tire to assure retention of the tire bead with the wheel rim during the tire mounting operation, the improvement comprising,

a first jaw plate secured to a jaw component of the tool in an inclined relationship to the tool centerline and having an outwardly disposed surface for restraining abutment with a tire sidewall, said jaw plate having a forwardly projecting lip segment the inner side of which being engageable with the wheel intermediate the wheel rim and the tire bead,

a second jaw plate carried by the remaining jaw component of the hand tool and terminating outwardly in an inclined segment forwardly spaced from the lip segment of said first jaw plate and thereat adapted for surfacial clamped engagement with the wheel, and

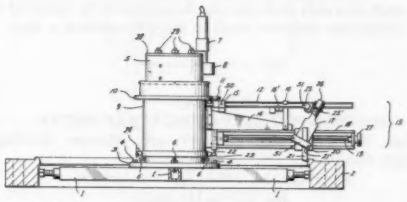
said first and second jaw plates cooperating when clamped to the wheel to position said outwardly disposed surface of the first jaw so as to confine the tire sidewall and adjacent tire bead against separation from the wheel rim during tire mounting.

3,908,491

FLANGE FACING AND CUTTING TOOL

Guy T. Gilmore, Houston, Tex., assignor to Multi-Kab, Inc., Houston, Tex.

Filed Mar. 22, 1974, Ser. No. 453,947
Int. Cl.² B23B 3/22
U.S. Cl. 82—4 C 6 Claims



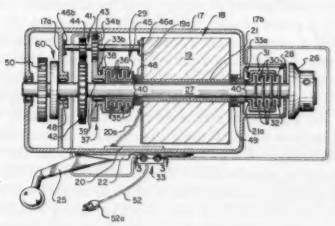
1. In a flange facing device, a rotating housing and a stationary housing, and a base member upon which said housings are mounted, means for supporting said base member on the work, an air motor and a gear assembly for rotation of said rotatable housing, a tool holding assembly on said rotatable housing, a support member in said assembly having an upper arm and a lower arm, said upper arm reciprocably mounted on said rotatable housing and means on said stationary housing for reciprocating said upper arm, and a toolholder adjustably mounted on said arms, means operable by the reciprocating movement of said upper arm for feeding the tool in said tool holder into the work as the rotatable housing rotates.

3,908,492

VARIABLE SPEED MOTOR DRIVEN MACHINE TOOL

M. Leon Roskelley, 1817 N. Beck St., Salt Lake City, Utah 84116

Filed July 16, 1973, Ser. No. 379,589
Int. Cl.² B23B 19/00
U.S. Cl. 82—29 R 5 Claims



1. A machine tool comprising

a housing;

a variable speed electric motor arranged within said housing;

a hollow armature shaft turned by said variable speed electric motor, said hollow armature shaft having ends protruding outwardly of said electric motor;

means for regulating electrical current to said variable speed electric motor whereby said hollow armature shaft is rotated at a desired speed;

a drive shaft having a work engaging portion on one end;

means journaling said drive shaft through said hollow armature shaft, said drive shaft extending from the ends of said armature shaft;

a first magnetic clutch means at one end of the hollow armature shaft for directly coupling one end of said hollow armature shaft to said drive shaft;

reduction gearing including a gear fixed to and rotatable with the drive shaft;

a second magnetic clutch means at the other end of the hollow armature shaft for indirectly coupling said hollow armature shaft to said drive shaft through said reduction gearing when said clutch is appropriately energized; and means for electrically insulating said first and second magnetic clutch means from one another;

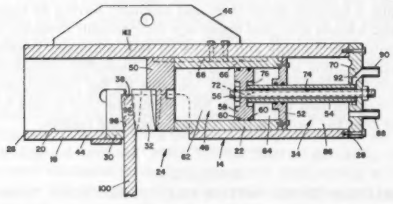
means for controlling the said first and second clutch means such that only one said clutch means will be operated to couple the armature shaft to the drive shaft at a time.

3,908,493

METHOD FOR SALVAGING SCRAP METAL

Eugene W. Sivachenko, 6851 Waverly Manner, Redding, Calif. 96001

Filed Apr. 25, 1974, Ser. No. 464,596
Int. Cl.[2] B21D *28/02*
U.S. Cl. 83—23 **13 Claims**



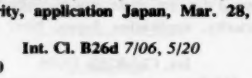
1. A method for converting large metallic strucutres into relatively small pieces of scrap metal for shipment of the scrap metal to a point of use, the method comprising the steps of providing a press having cooperating male and female dies, the female die defining a die opening, placing the press over a portion of the structure so that the portion is disposed between cooperating elements of the dies, positioning the press so that the portion of structure covers substantially less than the full outline of the female die opening to facilitate subsequent discharge of a piece of scrap metal from the opening, energizing the press to move the die elements into engagement with the portion, cutting a piece of scrap metal by sequentially severing the portion from the structure along a curved shear line from a beginning of the line to an end thereof, thereafter separating the die elements from engagement with the structure, moving the press along the structure to another portion, and cutting another piece of scrap metal by sequentially severing the other portion from the structure along the curved shear line.

3,908,494

CUTTING APPARATUS

Mitsuaki Wada, Kawaguchi, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Japan

Filed Mar. 28, 1973, Ser. No. 345,593
Claims priority, application Japan, Mar. 28, 1972, 47-31079
Int. Cl. B26d *7/06, 5/20*
U.S. Cl. 83—80 **5 Claims**



1. A cutting apparatus for cutting a length of scrap material into pieces of scrap comprising: means receptive of a length of scrap material during use of the apparatus for feeding the scrap material along a given path, said means including a pair of rotatable rollers respectively disposed on opposite sides of said given path, mounting means mounting said pair of rollers for movement into and out of engagement with the scrap material, fluid motor means for actuating said pair of rollers into engagement with the scrap material, means for resiliently biasing said pair of rollers out of engagement with the scrap material, and drive motor means for rotationally driving said pair of rollers to effect feeding of the scrap material along said given path when said pair of rollers are in engagement with the scrap material and having means responsive to an output signal for terminating the rotational driving of said pair of rollers; cutting means disposed along said given path at a location downstream from said pair of rollers for cutting the fed scrap material into pieces of scrap; detecting means for detecting when the length of material to be fed to said cutting means is less than a certain value and developing said output signal and applying it to said drive motor means to terminate rotational driving of said pair of rollers thereby terminating the feeding of the scrap material which then remains engaged between said pair of rollers; and control means for controlling the operation of said motor means

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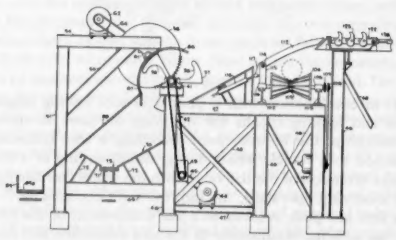
3,908,495

LOG PROCESSING MACHINE

Thomas P. Bush, Jr., 133 Red Oak Rd., Birmingham, Ala. 35206, and Samuel Edward Grant, 7254 Sandy Bluff Dr., Jacksonville, Fla. 32211

Division of Ser. No. 177,257, Sept. 2, 1971. This application Jan. 14, 1974, Ser. No. 432,872
Int. Cl. B27b *5/02, 25/00*
U.S. Cl. 83—112 **14 Claims**



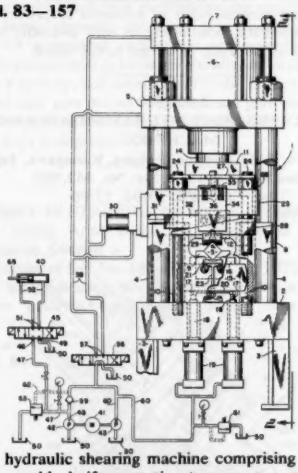
1. In an improved log handling system for use in processing logs, the improvement comprising, in combination:

a. a plurality of operable cutting means supported on said system at predetermined spaced locations for severing a log at a plurality of spaced points;
b. a first log conveying means for conveying a log away from said cutting means; and
c. log feeding means including:
i. rotatable feed means having circumferentially spaced arms provided with log cavity portions for receiving and advancing a log past said operable cutting means whereby said log will be cut into a plurality of predetermined lengths;
ii. ramp means adjacent said first log conveying means, said ramp means having a selectively movable portion for movement between a ramp conveying position whereby a log will be conveyed to said rotatable feed means for engagement by said log cavity portions and to a displaced position which will direct a log onto said first log conveying means; and
iii. power control means connected to said selectively movable portion for moving said selectively movable portion between said ramp conveying position and said displaced position; and
d. second feeding means for moving logs from a point remote from said system to a position above said ramp means.

3,908,496
HYDRAULIC SHEARING MACHINE

Heinrich Moelbert, Hamburg, N.Y., assignor to Advanced Machine Design Company, Cleveland, Ohio

Continuation of Ser. No. 324,872, Jan. 18, 1973, abandoned. This application Feb. 28, 1974, Ser. No. 446,781
Int. Cl.² B26D 7/04
U.S. Cl. 83—157 **12 Claims**

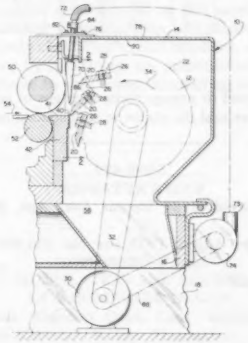


1. A hydraulic shearing machine comprising a fixed knife and a movable knife operative to engage opposite sides of longitudinally adjacent sections of a bar or the like to be sheared; a yieldable back support member opposite said movable knife operative to move with the latter during the shearing operation; a hold down member opposite said fixed knife operative to hold the bar in fixed position against said fixed knife during shearing movement of said movable knife; parallel connected fluid motors operative to move said movable knife and said hold down member toward and away from the bar; pump means and directional control valve means operatively connected to said fluid motors to actuate them by substantially equal fluid pressures to apply hold down force proportional to the shearing force as applied by said knife actuating motor; and a fluid motor operatively connected to said back support member and having fluid communication with the fluid pressure line between said pump means and said directional control valve means whereby the back support force is also proportional to the shearing and hold down forces.

3,908,497
METHOD AND APPARATUS FOR CONTROLLING NOISE PRODUCING EQUIPMENT

Sunil Chunilal Shah, Cranston, R.I., assignor to Cumberland Engineering Company, Inc., Pawtucket, R.I.

Filed Feb. 20, 1974, Ser. No. 444,248
Int. Cl.² B26D 7/00
U.S. Cl. 83—169 **14 Claims**



1. Apparatus comprising, movable means, second means arranged in close proximity to said movable means, said movable means and said second means coacting to disturb the atmosphere and produce noise, said second means defining an approaching zone for said movable means and a receding zone for said movable means, and suction means operable to produce a reduced pressure proximate said movable means and said approaching zone, said reduced pressure being less than the pressure in said receding zone, to thereby reduce the level of said noise.

3,908,498
PUNCHING APPARATUS

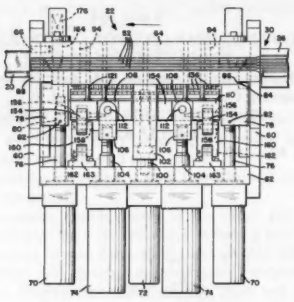
Paul E. Seaborn, Los Gatos, Calif., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 14, 1973, Ser. No. 415,672
Int. Cl.² B26F 1/02
U.S. Cl. 83—210 **15 Claims**

2. Punching apparatus comprising:
a. a plurality of stacked die plates extending in spaced relationship to each other and defining a plurality of spaced apart, lift receiving spaces between adjacent die plates,
b. means defining a plurality of aligned die openings extending through said stacked die plates,
c. means for moving said die plates toward each other to clamp portions of a plurality of lifts received between said die plates in said lift receiving spaces,
d. a plurality of punches aligned with said openings in said die plates,
e. means for moving said punches into said openings in said die plates to punch holes through said portions of lifts clamped between said die plates in said lift receiving

spaces, and

f. die plate stop members having stepped die plate engaging



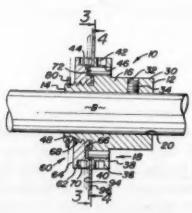
seats adapted to engage stepped edges of said die plates and support said die plates in said spaced relationship.

3,908,499

KNIFE RETAINER

William Dale Reed, 9151 Mentor Ave., Apt. B10, Mentor, Ohio 44060

Filed Aug. 1, 1973, Ser. No. 384,492
Int. Cl.[2] B23D *19/00*
U.S. Cl. 83—665 **19 Claims**



1. A knife blade retainer device for conveniently mounting a rotary cutting knife blade having a cutting surface disposed adjacent the outermost edge thereof on an elongated arbor, said retainer comprising:

an elongated body portion adapted to be generally axially received over a portion of said arbor, said body portion including a first knife engaging surface and means for selectively affixing said body portion to said arbor;

means on said body portion for releasably receiving a knife locking member;

knife blade locating means adapted to engage said knife and prevent relative rotation between said knife and said retainer; and

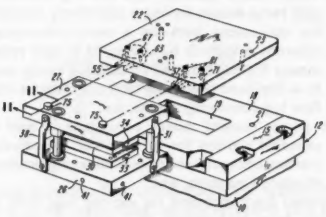
a knife blade locking member including a second knife blade engaging surface thereon, said locking member being selectively receivable on said receiving means and movable thereon between a first non-locking position with said second engaging surface axially spaced from said first engaging surface and a second knife locking position with said first and second engaging surfaces closely spaced from each other with said knife blade clamped therebetween, the knife blade locking member further including means in said knife blade locking member for providing room for said knife blade locating means to allow said second knife blade engaging surface to engage said knife blade.

3,908,500

APPARATUS FOR MOUNTING A TOOL HOLDER OR LIKE ASSEMBLY TO A BACKING STRUCTURE

Robert J. Gargrave, and Ludomil A. Holiga, both of Dayton, Ohio, assignors to Dayton Progress Corporation, Dayton, Ohio

Division of Ser. No. 313,163, Dec. 7, 1972, Pat. No. 3,848,494.
This application Aug. 21, 1974, Ser. No. 499,268
Int. Cl. B26d *7/26*
U.S. Cl. 83—700 **11 Claims**



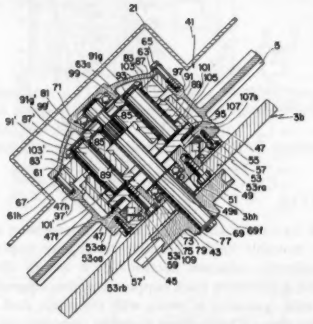
2. Apparatus for simple and precise positioning of a tool holder or like assembly relative to a backing structure characterized by said assembly and its backing structue having in connection therewith means for a sliding interfit of one to the other, said interfitting means including portions which provide, on contact, a precise datum control point for a referenced positioning of one of said assembly or its backing structure relative the other, and other portions formed to accommodate discrepancies in the prescribed positions thereof relative said datum control point so arranged to provide for a simple and automatic positioning of said assembly on said backing structure on a slip fit of one to the other.

3,908,501

SPEED-REDUCING DRIVE MECHANISM FOR BANDSAW MACHINES

Tsuneo Aizawa, 1453-4 Ishida, Isehara, Kanagawa, Japan

Filed Feb. 15, 1974, Ser. No. 442,783
Int. Cl.[2] B23D *53/06, 55/06*
U.S. Cl. 83—788 **6 Claims**



1. A bandsaw machine comprising a support base, a cutting head movably mounted over said support base and including a driving wheel, a driven wheel, and an endless bandsaw blade extending about said driving wheel and said driven wheel, power means for rotating said driving wheel, a speed reducing drive mechanism driven by said power means and mounted on said cutting head and including a power input shaft extending along the axis of rotation of said driving wheel, and said speed reducing drive mechanism including speed reducing means interconnected between said power input shaft and said driving wheel and disposed substantially in concentric relation to

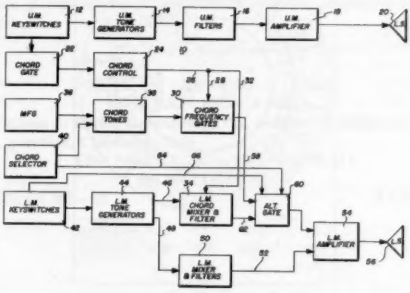
said driving wheel for reducing the rotational velocity from said power input shaft to said driving wheel.

3,908,502

ELECTRONIC ORGAN WITH CHORD CONTROL

Dennis E. Kidd, and Anthony C. Ippolito, both of North Tonawanda, N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,701
Int. Cl.² G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **11 Claims**



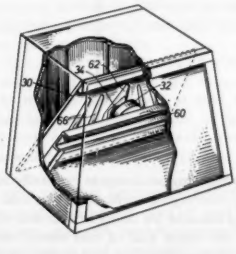
1. In an electronic musical instrument, the combination comprising means for generating electric oscillations corresponding to the notes of a chord, manually operable means for selecting the electric oscillations of a desired chord, gate means to which selected oscillations are supplied, said gate means being normally inoperative to pass said oscillations means for generating oscillations corresponding to melody notes, keyboard means having a plurality of keys for manually playing a melody, and means electrically interconnecting said keys and said gate means to render said gate means effective to conduct manually selected chord oscillations whenever one of said keys is depressed.

3,908,503

DEVICE IN STRINGED MUSICAL INSTRUMENTS

Gustav Georg Arne Bolin, 12, Renstiernas Gata, 11631 Stockholm, Sweden

Continuation of Ser. No. 292,690, Sept. 27, 1972, abandoned. This application Nov. 6, 1973, Ser. No. 413,301
Claims priority, application Sweden, Sept. 28, 1971, 12274/71
Int. Cl.² G10F *1/02*
U.S. Cl. 84—1.16 **2 Claims**



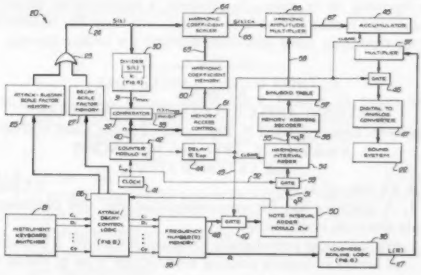
1. Apparatus for producing and amplifying musical sound comprising the combination of a musical instrument having a plurality of strings which produce sound by vibration, an independent pressure responsive microphone connected to each of said strings, said microphones transmitting vibrations along a common leader to an amplifier, sound distributing means located in a position remote from said musical instrument, said sound distributing means having substantially similar tonal characteristics as the musical instrument and including a resonance box having wall structure defining an enclosed area of generally trapezoidal configuration, said resonance box having at least one opening, a wooden soundboard mounted within said box, said soundboard having a first pair of generally parallel edges and a second pair of edges disposed at an angle to each other and defining a trapezoid which engages portions of said wall structure, a first elongated strip mounted on said soundboard and having a longitudinal axis disposed generally centrally between the angularly disposed edges of said soundboard, at least two additional elongated strips mounted on said soundboard at opposite sides of said central strip and spaced therefrom, said additional strips having longitudinal axes disposed at an angle to the axis of said first strip, support means located within said resonance box, an electromagnetic coil mounted on said support means and coupled to said first elongated strip, said electromagnetic coil being operatively connected to said amplifier, whereby vibrations produced by said strings are amplified and reproduced at greater volume by said sound distributing means.

3,908,504

HARMONIC MODULATION AND LOUDNESS SCALING IN A COMPUTER ORGAN

Ralph Deutsch, Sherman Oaks, Calif., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 19, 1974, Ser. No. 462,358
Int. Cl.² G10H *1/02, 5/00*
U.S. Cl. 84—1.19 **16 Claims**

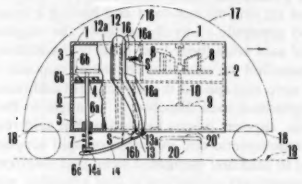


1. In an electronic musical instrument wherein each note is synthesized in real time, said instrument including calculation circuitry for separately evalulating the constituent Fourier componenets of each note, and accumulation circuitry for summing said evaluated components, and attack/decay control circuitry for varying the envelope amplitude of each note during attack and decay portions of note synthesis, the improvement wherein said instrument includes harmonic modulation means, connected to said calculation and accumulation circuitry, for preventing certain nstituent Fourier components from being included in said summation, in proportion to the note envelope amplitude concurrently established by said attack/decay control circuitry.

3,908,505
MELODY BLOWING DEVICE

Tasuku Ono, Tokyo, Japan, assignor to Stiron Chemical Industry Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. Nos. 377,143, July 6, 1973, and Ser. No. 288,405, Sept. 12, 1972, Pat. No. 3,747,266. This application Aug. 6, 1974, Ser. No. 495,137
Int. Cl.² G10F 1/12
U.S. Cl. 84—83 8 Claims



1. A melody blowing device comprising, a casing forming a main resonant chamber having an orifice therein to produce a musical note in response to air blown therethrough, said casing also forming a plurality of discrete auxiliary chambers each having a resonant volume differing from the others and each having a respective one of a plurality of apertures to place each auxiliary chamber individually in communication with said main chamber, a plurality of valves each associated with a respective one of said apertures and movable to open and close the same, spring means urging each said valve to the closed position, a plurality of valve push plates each movable to engage a respective one of said valves and move the same to open its aperture against the bias of said spring means, a control plate having a portion normally overlying said orifice and movable to expose the same, to produce a musical note, a plurality of control blocks movable as a unit relatively to said casing and in response to relative movement with respect to the casing, engaging and moving each respective push plate in desired sequence, means operable to move said control plate to orifice-exposing position each time a control block effects an opening of its valve, to produce a sequence of musical notes, and means operable to continuously urge the expulsion of air from said main chamber, through the orifice therein.

3,908,506
DIATONIC AND CHROMATIC CHORD DIAL

Verna M. Leonard, 6351 N. Blackstone, Fresno, Calif. 93710

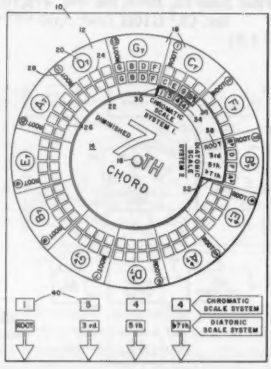
Filed Feb. 22, 1974, Ser. No. 444,897
Int. Cl.² G09B 15/02
U.S. Cl. 84—471 1 Claim

1. A teaching aid for correlating diatonic and chromatic scale intervals comprising:

a disc having in peripherally arranged segments, a plurality of arrays of indicia naming a particular type of chord in a like number of key signatures, two radially adjacent annular concentric rows of spaced blank squares being provided radially inwardly of said arrays of indicia for the inscription in duplicate of the names of the scale tones of the chords denoted by said arrays, the individual squares of each of said rows being in radial alignment with the individual squares of the other of said rows;

a planar member mounted centrally for rotative adjustment on said disc and having a major portion extending a radial distance from the central mounting thereof short of the inner row of said rows of squares, a first arcuate edged portion the edge of which falls substantially into alignment with the inner margin of the inner row of squares and a second arcuate edged portion adjacent the first portion the edge of which extends over the inner row of squares and falls substantially into alignment with the inner margin of the outer row of squares;

one of said arcuate edged portions having indicia adjacent the edge thereof denoting the chromatic scale tone intervals of the scale tones of said named particular type of chord, the chromatic scale indicia being arranged such that the scale intervals denoted thereon can be moved into individual juxtaposition with a number of squares upon proper rotative adjustment of said planar member;

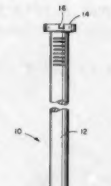


the other of said arcuate edged portions having indicia adjacent the edge thereof denoting the diatonic scale tone intervals of the scale tones of said named particular type of chord, the diatonic scale indicia being arranged such that the scale intervals denoted thereon can be moved into individual justaposition with a like number of squares upon proper rotative adjustment of said planar member.

3,908,507
WOOD ANCHORING NAIL

Alan J. Solo, Brooklyn, N.Y., assignor to Knock-N-Lok International, Inc., Brooklyn, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,393
Int. Cl.² F16B 15/00
U.S. Cl. 85—30 3 Claims



1. A nail comprising an elongate generally round shank, said shank having converging surfaces at one end thereof to form a cutting edge suitable for being driven into wood; an engageable head at the other end of said shank; and an anchoring portion in the region of said cutting edge which projects laterally of said shank along a direction substantially normal to the axial length of said shank to form therewith anchoring shoulders on diametrically opposing sides of said shank, said shoulders tapering from the major portion of said shank to form concave surfaces facing in the general direction of said head

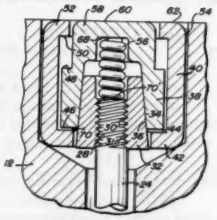
and merging with said cutting edge to form a point at each end thereof, said anchoring portion having a maximum transverse dimension and an maximum axial dimension, the ratio of said axial dimension to said transverse dimension being less than approximately 0.2, and the ratio of the diameter of said shank to said transverse dimension being approximately 0.5, whereby said converging surfaces on said anchoring portion form cutting surfaces sufficiently small to facilitate turning of the nail after being driven into a relatively hard penetrable material by engagement of said head with a suitable tool, and said shoulder is made sufficiently large to assure good anchoring of the nail in the driven position, after being turned angularly about the axis thereof from the initial driven position, due to engagement of said shoulder with the penetrable material.

3,908,508

STRAIN INDICATOR

William J. Payne, Greensburg, Pa., assignor to Modulus Corporation, Cleveland, Ohio

Filed Sept. 23, 1974, Ser. No. 508,211
Int. Cl.² G01D *21/00*
U.S. Cl. 85—62 **5 Claims**



1. An optical stress-strain indicator comprising in combination:

a first member subject to stress-strain and having a head and a recess extending from said head into said member;

a second member received within said first member and having a first end and a second end, said first end being secured to said first member;

a body member having a viewing area, said body member being secured to said first member with said viewing area substantially adjacent said head so as to be visible;

an indicator element disposed within said body member;

releasable connecting means interconnecting said indicator element and said second end of said second member;

bias means interposed between said indicator element and said second member, whereby:

a. as said first member undergoes an elastic change in length, said second end of said second member is caused to move with respect to said body with the result that said indicator element is caused to move inwardly with respect to said body, thereby giving a visual indication of the change of length of said first member;

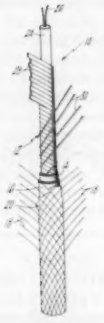
b. as said first member undergoes a further change in length exceeding a preset limit of said first member, said indicator element becomes separated from said second member as said releasable connecting means is caused to release said indicator element from said second member and said bias means causes said indicator element to move to an extended position at least partially outside of said body member giving a visual indication of a load on said first member.

3,908,509

FUSE AND ITS METHOD OF MANUFACTURE

Cornelius James Noel Kelly; William Clinton Morrow, both of Simsbury, and Alvaro Zappalorti, Avon, all of Conn., assignors to E-B Industries, Inc., Simsbury, Conn.

Filed Oct. 29, 1973, Ser. No. 410,915
Int. Cl.² C06B *21/00;* **F42B** *33/10*
U.S. Cl. 86—1 R **10 Claims**



1. A process for producing safety fuse comprising the steps of providing an intimate mixture of sulfur and charcoal having an average particle size of less than 45 microns, providing alkali metal nitrate particles having an average particle size of less than 45 microns, blending the intimate admixture of sulfur and charcoal with the nitrate particles without subjecting the blend to substantial grinding forces to provide a powder blend exhibiting fluid characteristics, flowably forming the powder blend into a continuous powder column and confining the column within a split-film yarn wrapping exhibiting a relatively flat ribbon like configuration, said wrapping being in intimate confining relationship with the powder column and being comprised of a multitude of flexible individual filaments integrally interconnected in a net-like array.

3,908,510

ADJUSTABLE DEPTH ROUTER

Nick J. Koskolos, Affton, and Ralph R. Lefarth, St. Louis, both of Mo., assignors to Intertherm, Inc., St. Louis, Mo.

Filed July 1, 1974, Ser. No. 484,770
Int. Cl.² B23C *1/20*
U.S. Cl. 90—12 D **1 Claim**

1. A router adapted for subsurface cutting through a surface opening without use of an extension shaft, comprising

A. a slidable base frame including

a base plate having a planar lower face with a central opening therethrough,

a frame portion arising therefrom and having an upper circular frame opening not larger than the central opening of the base plate, in axial registration therewith and at a fixed vertical spacing thereabove, whereby to define an axis for depth adjustment, and

releasable means adjacent to said upper opening to clamp inwardly thereabout, in combination with

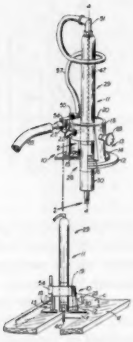
B. an elongated router tool including

1. a lower cylindrical portion comprising a pneumatic motor having a cylindrical wall casing of such diameter as to be slidable within said upper frame opening and having at its lower end a chuck in which a router bit may be held centrally and an air outlet thereabout, and having inwardly of its wall an upper inlet for compressed air, and 2. an upper elongated tubular cylindrical extension casing whose outer surface is of the same diameter as that of the

motor casing and secured to its upper end, whereby to form with it a constant diameter wall,

the extension casing being of greater length than the motor casing and further being of greater length than the spacing from said base plate to said clamping means adjacent to the frame upper opening,

said tubular casing having at its upper end a compressed air inlet and at its lower end means to deliver compressed air to the inlet of said motor,



whereby for subsurface routing through an opening in a surface on which the base plate rests, the elongated router tool may be positioned adjustably downward so that the motor casing projects below the base plate, and may be clamped in position determined by the height of the extension casing remaining above said clamping means, the router in operation being guided along the edges of such surface opening by bearing against such edges of said constant diameter wall.

3,908,511

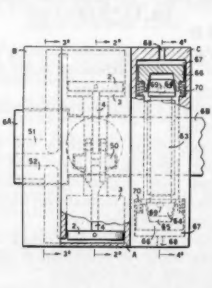
DEVICE FOR FEEDING MATERIAL INTO WORK PERFORMING MACHINES

Giancarlo Spiantini, Via Monfalcone 12/B, and Giacomo Bardoni, Via Brenta 3, both of Milan, Italy

Filed Oct. 18, 1973, Ser. No. 407,651

Int. Cl.² B23D *1/08*

U.S. Cl. 91—44 **4 Claims**



1. A device for feeding material into a work-performing machine, said device comprising a casing having a central part and two lateral parts, a central shaft portion extending through one of the lateral parts and into the central part, another central shaft portion extending from the central part and through the other lateral part, the central part having a linkage interconnecting the central shaft portions, radial cylinders, piston reciprocating in said cylinders, connecting rods connecting said pistons with said linkage, one lateral part having a rotary body connected with the first-mentioned central shaft portion and having hollow sectors, input and output pipes communicating with the outside and ducts connected with said pipes and said sectors and communicating with said radial cylinders, whereby said one lateral part serves for the distribution of pressurized fluid for the drive of the central shaft portions, the other lateral part comprising blocks carried by said other central shaft portion and two half rings engaging said blocks and surrounding said other central shaft portion, whereby said other lateral part serves to lock the central shaft portions in the performance sequence of the machine, wherein the other lateral part has two bell-shaped pistons with cavities, said half-rings having two pairs of protuberances located diametrically opposite each other and extending into said cavities, the outer surfaces of said protuberances and the inner surfaces of said cavities being in sloped planes, whereby said pistons are adapted to press said protuberances against each other to lock the secondmentioned shaft portion.

3,908,512

EXPLOSION GAS OPERATED PISTON-CYLINDER STRUCTURE

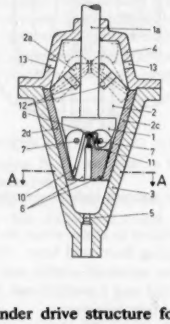
Harald Strubin, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed June 12, 1973, Ser. No. 369,248

Claims priority, application Switzerland, July 12, 1972, 10352/72

Int. Cl.² F15B *9/02*

U.S. Cl. 91—357 **1 Claim**



1. A piston-cylinder drive structure for use in actuating electric switchgear apparatus comprising a cylinder including a conical housing containing two pairs of oppositely disposed segment-shaped elements establishing a working chamber for explosion gases admitted through an inlet at the smaller end of the housing, a first pair of said segment-shaped elements establishing a pair of oppositely disposed wedge-shaped bounding surfaces and a second pair of said segment-shaped elements establishing a second pair of oppositely disposed parallel bounding surfaces which together establish a working chamber having a rectangular cross-section and whose area progressively increases in the drive direction of the piston travel from the explosion gas inlet end, a drive piston within said working chamber, said drive piston including a piston rod extending through the larger end of said housing and having an area-expandable head slidable in contact with the said bounding surfaces of said chamber from the smaller to the larger area end in response to the pressure of the explosion gases, said piston head comprising two pivotally mounted flaps and spring means cooperable therewith and which serve to maintain said flaps in sealing contact with said pair of wedge-shaped bounding surfaces, the sides of said pivotally mounted flaps in contact with said second pair of oppositely disposed parallel bounding surfaces including slots containing spring-loaded sealing strips which function as piston seals with re-

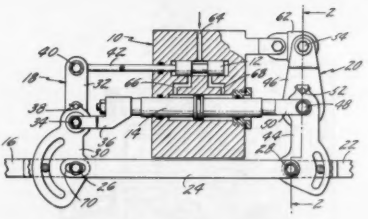
spect to said parallel bounding surfaces, and at least one of said second pair of segment-shaped elements including a port for discharge of spent gases therethrough into the larger end of said housing and thence through an escape opening therein into the surrounding atmosphere, said spent gas discharge port being uncovered by said piston when it reaches the end of its working stroke.

3,908,513

SERVO JAM BY-PASS LINKAGE

Ray Dennis Leoni, Woodbridge, Conn., assignor to United Technologies Corporation, East Hartford, Conn.

Filed Mar. 11, 1974, Ser. No. 450,131
Int. Cl.[2] F15B 9/10, 13/10
U.S. Cl. 91—384 **7 Claims**



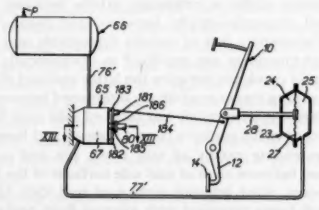
1. In an aircraft control system,
a hydraulic servo,
a control system input to said servo, and
a control system output from said servo,
first lever means between said control input and said servo and second lever means between said control output and said servo,
said first and second lever means each including a pair of levers having a common pivot point,
means directly connecting said control input and said control output,
and means associated with said first and second lever means including pins shearable upon the application of a control system input force for effecting control system operation through said directly connecting means upon jamming of said servo.

3,908,514

ASSISTANCE DEVICE FOR A CONTROL ESPECIALLY A CLUTCH CONTROL FOR AUTOMOBILES

Michel Theophile Rist, 119 Avenue Morizet, 92 Boulogne, France

Continuation of Ser. No. 197,882, Nov. 11, 1971, abandoned.
This application Dec. 18, 1973, Ser. No. 425,921
Claims priority, application France, Nov. 30, 1970, 70.40595; Apr. 19, 1971, 71.13693
Int. Cl.[2] F15B 13/10
U.S. Cl. 91—391 R **31 Claims**



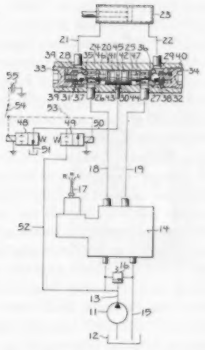
1. Actuating mechanism comprising linkage means including a control lever mounted for rotation about a fixed pivot in response to force exerted by an operator, and operating means arranged at one end of said control lever spaced from said fixed pivot, said linkage means being free of lost motion between a point of force application by the operator and said operating means and immediately, directly and positively transmitting force exerted by the vehicle's operator to said operating means from the beginning of the rotation of the control lever, assistance means arranged along the linkage means and bearing directly on said control lever between the point of force application by the operator and said operating means, said assistance means including a power cylinder having two chambers, a movable wall separating said chambers, a piston connected to the movable wall and to a first point along the lever spaced from said fixed point, one of the chambers being at atmospheric pressure, the other chamber being connected to a source of pressure other than atmospheric, said assistance means further including sensing means responsive to the movement of a second point on said linkage means spaced from said fixed pivot for controlling said other chamber, whereby upon force being exerted on the control lever by an operator the power assistance produced by the power cylinder acts in parallel to the direct and positive transmission of said force from the control lever to the operating means.

3,908,515

HYDRAULIC CIRCUIT WITH SELECTIVELY ACTUATABLE FLOAT CONTROL

Howard L. Johnson, Joliet, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Sept. 10, 1973, Ser. No. 395,647
Int. Cl.[2] F15B 11/08, 13/042, 13/043
U.S. Cl. 91—420 **3 Claims**



1. In a hydraulic system for selectively positioning a work member in selected fixed positions the combination comprising:
a linear double-acting hydraulic motor connected to a work member, a source of fluid pressure including a sump and a pump for supplying fluid for operating said motor, a three position directional control valve in a valve housing and having a neutral position, and raise and lower positions for selectively directing fluid from said source to either end of said motor for operation of said motor for positioning said work member, a single control lever for operating said control valve, lock valve means including first and second passage means communicating said fluid respectively with alternate ends of said motor, check valve means disposed in each said passage means to normally block flow of said fluid from said motor and including pressure-responsive piston and plunger means in each said passage means for unseating said check valve means to provide communication between both ends of said motor and sump by way of said directional

control valve, said check valve means disposed between said control valve means and said hydraulic motor for normally locking said motor in a selected position;

solenoid operated auxiliary valve means separate spaced from and independent of said directional control valve and valve housing disposed between said source of fluid pressure and said lock valve means for bypassing said directional control valve for directing fluid solely to each said piston and plunger means solely for unseating each said check valve means for communicating both ends of said motor with said sump by way of said directional control valve for enabling free floating movement of said hydraulic motor when said main control valve is in a neutral position between said raise and said lower positions.

3,908,516

TIMING VALVE FOR MULTIPISTON HYDROSTATIC ENGINES

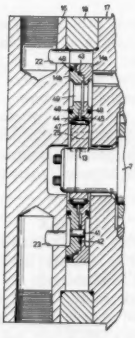
Keith F. Burton, and Alan E. G. Wenbourne, both of Kent, England, assignors to Twin Disc, Incorporated, Racine, Wis.

Filed May 2, 1973, Ser. No. 356,519

Claims priority, application United Kingdom, May 26, 1972, 24902/72

Int. Cl.² F01B *3/00*

U.S. Cl. 91—476 **1 Claim**



1. A timing valve for controlling the flow of operating fluid to and from the cylinders of a multipiston hydrostatic engine having a piston actuated main eccentric on its drive shaft, said valve comprising an auxiliary eccentric on said drive shaft in 90° out of phase relation to said main eccentric; a housing surrounding said auxiliary eccentric; a pair of one-piece valve rings each having a central hub portion surrounding said auxiliary eccentric and an annular marginal portion spaced radially from said hub portion; bearing means within said hub portion radially supporting said valve rings on said auxiliary eccentric for rotation thereon and for axial shifting movement relative to each other; annular sealing means operatively associated with said bearing means and valve rings so as to suppress radial inward passage of pressure fluid past relatively adjacent side surfaces of said hub portions; and annular sealing means operatively interposed between said valve rings so as to suppress radial inward and outward passage of pressure fluid past relatively adjacent side surfaces of said marginal valve ring portions; one of said valve rings being provided with a radially inner and a radially outer sealing surface in cooperative engagement with a ported axially outer side wall of said housing, and the other of said valve rings being provided with a radially inner and a radially outer sealing surface in cooperative engagement with a ported axially inner side wall of said housing.

3,908,517

HYDROSTATIC ENGINE CONTROL

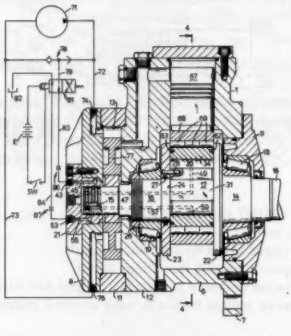
Alan E. G. Wenbourne, Strood, England, assignor to Twin Disc, Incorporated, Racine, Wis.

Filed May 11, 1973, Ser. No. 359,612

Claims priority, application United Kingdom, May 26, 1972, 24903/72

Int. Cl.² F01B *13/06*

U.S. Cl. 91—497 **1 Claim**

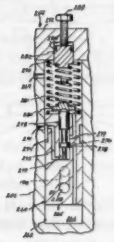


1. In a multipiston hydrostatic engine of the radial cylinder type the combination of a crank case, a crank shaft rotatably mounted in said crank case and having a pair of axially spaced radial flanges therein and a crankpin extending axially between said flanges, said crank pin having a pair of plane side surfaces at opposite sides of and in parallel relation to a radial plan through the journal axis of said crankshaft, and diametrically opposite arcuately convex surfaces extending axially between said flanges and transversely between said plane side surfaces; an annular slide block surrounding said crank pin in radially back and forth shiftable relation thereto, said slide block having a pair of parallel diametrically opposite plane internal surfaces in contacting relation with said plane parallel side surfaces of said crank pin, axially opposite radial end faces in contacting relation, respectively, with adjacent radial surfaces of said flanges and radially opposite arcuately concave internal surfaces extending axially between said end faces and circumferentially between said parallel internal surfaces whereby a pair of radially expandable and contractable fluid chambers are provided at diametrically opposite sides of said crank pin between the latter and said slide block; annular sealing means operatively interposed between each of said axially opposite radial end faces of said slide block and the adjacent radial surfaces of said flanges; and linear sealing means extending axially of said crank pin and operatively interposed between each of said side surfaces of the latter and the adjacent plane internal surface of said slide block, said crankshaft being provided with internal fluid passages communicating, respectively, with said fluid chambers; and thrust transmitting means operatively interposed between radially reciprocable engine pistons and said slide block.

3,908,518
FLUID DEVICE HAVING CONSTANT HORSEPOWER DISPLACEMENT CONTROL MEANS

Wilfred S. Bobier, Bloomfield Hills, Mich., assignor to The Oilgear Company, Milwaukee, Wis.

Division of Ser. No. 181,663, Sept. 20, 1971, Pat. No. 3,806,280, which is a continuation-in-part of Ser. No. 60,333, Aug. 3, 1970, Pat. No. 3,739,691. This application Oct. 30, 1973, Ser. No. 411,041
Int. Cl.² F01B *13/04*
U.S. Cl. 91—506 3 Claims

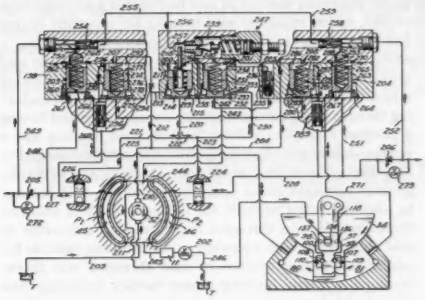


1. A fluid pressure energy translating device of the positive displacement type, said device comprising:
a housing having an inlet and an outlet;
first means for displacing fluid under pressure between said inlet and said outlet;
second means operatively connected to said first means, the displacement of fluid by said first means being varied in response to the predetermined positioning of said second means along a predetermined arcuate path;
a coupling means reciprically carried by said second means and adapted for movement along a linear path, said coupling means positioning said second means along said arcuate path when said coupling means is moved along said linear path;
a valve means responsive to the pressure of said fluid displaced between said inlet and outlet for positioning said second means along said arcuate path, said valve having a bore with a control member slidably mounted therein, said control member having pressure responsive surfaces at its opposite ends;
first spring means disposed within said valve bore and abutting one of said control member pressure surfaces for biasing said control to a predetermined position within said valve bore, said control member having a longitudinal bore opening to said one pressure surface of said control member, a portion of said control member bore being in constant communication with a source of pressure fluid generated by said translating device;
spool means slidably mounted in said control member bore and responsive to a predetermined pressure in said control member bore to communicate said pressure fluid to said valve bore at the other pressure surface of said control member to move same against the bias of said first spring means relative to said spool means to close communication of said pressure fluid between said control member bore and said other pressure surface of said control member after same has moved a predetermined distance;
second spring means disposed in said valve bore in coaxial arrangement with said first spring means for biasing said spool means to close said fluid communication, said control member being coupled to said second means by said coupling means.

3,908,519
CONTROL SYSTEMS FOR A VARIABLE DISPLACEMENT PUMP

Ellis H. Born; Alan H. Viles; Cecil E. Adams, all of Columbus, and David L. Thurston, Ashley, all of Ohio, assignors to Abex Corporation, New York, N.Y.

Filed Oct. 16, 1974, Ser. No. 515,270
Int. Cl.² F01B *15/24, 3/00;* F04B *1/26*
U.S. Cl. 92—12.2 19 Claims



1. An automatic control device for a variable displacement fluid energy translating device having a rocker cam pivotally mounted in a rocker cam support for changing the displacement of the device, fluid motor means for pivoting the rocker cam including a first fluid motor member attached to the rocker cam and a second fluid motor member cooperative with the first fluid motor member to define first and second sealed fluid receiving chambers, a servo pump for supplying servo pressure fluid, manual control means for selectively supplying servo pressure fluid to said fluid motor to selectively position the rocker cam between a first position of maximum pump displacement in which said one port is the working port and the other port is the inlet port and a second position of maximum pump displacement in which said other port is the working port and said one port is the inlet port, and the improvement comprising automatic control means for overriding said manual control means including compensating means operable when working fluid exceeds a first predetermined pressure to supply working fluid to said fluid motor to reduce displacement of the device until the working fluid maintains the first predetermined pressure, a first relief valve responsive to working fluid pressure and servo fluid pressure to limit the pressure of the working fluid supplied to said fluid motor to a second predetermined pressure and a second relief valve responsive to inlet fluid pressure and modified servo fluid pressure to maintain and limit the fluid exhausted from said fluid motor to a third predetermined pressure.

3,908,520
ADJUSTMENT MEANS FOR DOUBLE DIAPHRAGM SPRING BRAKE CHAMBER ACTUATOR

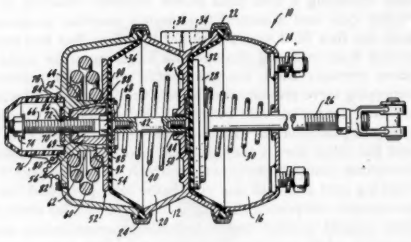
James W. Ma, Northfield, Ill., assignor to The Berg Manufacturing Company, Des Plaines, Ill.

Filed Oct. 25, 1973, Ser. No. 409,633
Int. Cl.² F15B *21/02;* F01B *19/00;* F16J *3/00*
U.S. Cl. 92—94 2 Claims

1. In a brake mechanism, a housing having side walls and having a rear wall with a substantially planar exterior surface, a diaphragm positioned within and peripherally held by said housing, air pressure inlet means in said housing communicating with one side of said diaphragm, a piston positioned in said housing on the opposite side of said diaphragm said piston being of suitable dimensions for reciprocating motion within said housing without engaging said side walls and having a generally conical, hollow hub extending away from said diaphragm, said piston including an annular rib disposed at the base of said hub, said housing having an inwardly-directed projection including a generally conical inner surface for

receiving said hub, said projection extending inwardly of said housing from said rear wall a distance approximating the extension of said hub from said piston with the axial depth of said conical inner surface being greater than the extension of said hub beyond said annular rib, said projection being of such other dimensions as to engage said annular rib without engaging any part of said hub when said hub is received within said projection and the axes of said conical hub and said conical inner surface are colinear, whereby an unobstructed air passage about the entire surface of said hub within said projection is provided, spring means in said housing for normally urging said piston and diaphragm in a brake operating direction,

limiting means for limiting the travel of said piston in said brake operating direction in response to said spring means including a threaded rod, said threaded rod including threads along substantially its entire length and having a portion extending outwardly from said housing and a portion telescopically arranged within said hollow piston hub through a passage in said hub along an axis generally aligned with said brake operating direction, said passage in said hub being suitable for sliding motion of said rod therethrough, said threaded rod extending outwardly of said housing through a passage in said housing suitable for permitting sliding motion of said threaded rod therethrough, and said limiting means further including first



means at one end of said rod within said hub and second means disposed along the length of said rod beyond the outer wall of said housing for limiting the piston travel to be generally equal to or less than the outwardly-extending and telescopically arranged threaded rod portions between said first and second means, said first means being effective to prevent complete removal of said rod from said hub and cooperatively operating with the inner surface of said hub to prevent rotation of said threaded rod, said second means being of dimensions sufficient to prevent its movement through said passage in said housing such that said second means cooperatively operates with said threaded rod and said first means to change the limit of travel of said piston when said second means is manually rotated, said hub extending from said piston substantially less than the maximum travel of said piston such that said threaded rod extends substantially beyond said housing when said spring means is compressed, whereby said second means is maintained substantially in the plane of said exterior surface of said housing or outwardly of that plane at all positions of said piston, and

cap means of dimensions sufficient to accommodate the maximum extension of said threaded rod beyond said exterior surface, and mounting means on said exterior surface for removably mounting said cap over said extending threaded rod portion.

3,908,521

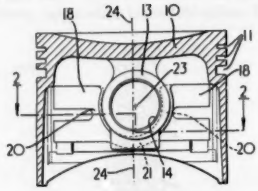
PISTONS FOR INTERNAL COMBUSTION ENGINES OR FOR COMPRESSORS

Frederick Edward Cockcroft, Allerton, England, assignor to Hepworth & Grandage Limited, Yorkshire, England

Continuation-in-part of Ser. No. 276,468, July 31, 1972, abandoned. This application Feb. 21, 1974, Ser. No. 444,477

Int. Cl.[2] F16J *1/04, 1/06*

U.S. Cl. 92—228 **7 Claims**



1. A light metal piston for an internal combustion engine or a compressor having a crown, a skirt integrally and completely connected to said crown around the opposing thrust faces of the piston in a manner to provide a closed internal cavity in the piston, gudgeon pin bosses having bores opening into said cavity, and two expansion-control inserts made of a material of lower coefficient of thermal expansion than the light metal, with each being superimposed on the inner surface of the skirt each said insert having

a pair of connecting portions each anchored in a gudgeon pin boss;

a pair of elongated first bands, having the inner face thereof entirely open to said cavity each extending from a said connecting portion at least part-way round one of said thrust faces to form a bimetallic element therewith, each said first band being near the crown end of said skirt;

a pair of elongated second bands, having the inner face thereof entirely open to said cavity each extending from a said connecting portion, being spaced apart from and substantially parallel with and independent from said first bands, each said second band extending at least part-say round one of said thrust faces to form a bimetallic element therewith, and each said second band being nearer to the open end of said skirt than each of said first band; and a pair of further portions each interconnecting one of said connecting portions, one of said first bands, and one of said second bands, with another of said connecting portions, first bands, and second bands,

whereby said second bands, being nearer to the open end of said skirt, exert a greater degree of thermal expansion control for a given temperature change than do said first bands which are near the crown end of the skirt.

3,908,522

PRODUCTION OF BAGS AND SACKS

Hugo Bender, Gerolzhofen, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed June 27, 1973, Ser. No. 374,081

Claims priority, application Germany, June 29, 1972, 2231838

Int. Cl.[2] B31B *49/04, 1/64*

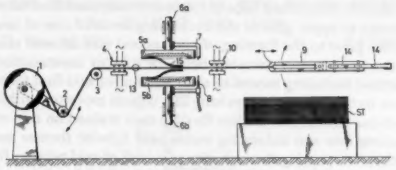
U.S. Cl. 93—35 R **7 Claims**

1. A process for the production of containers from thin-walled, stretched, seamless tubes of thermoplastic material which comprises

introducing a collapsed tube into an open clamp in a manner such that the edge of the tube projects beyond the clamp,

closing the clamp, and fusing said projecting edge into a seam adjacent the clamp,

the extent of the projecting portion of the tube being sufficient to produce a seam of a thickness of 2 to 10 times the total thickness of the superposed layers of film, and the



fusing operation being effected at a temperature such that no degradation of the thermoplastic material results, and stretching the seam of the completed container.

3,908,523

METHOD OF MAKING LIQUID-TIGHT CUP

Yukihiro Shikaya, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Nov. 5, 1973, Ser. No. 413,021

Claims priority, application Japan, Nov. 15, 1972, 47-131448

Int. Cl.² B31B *7/00*; B65D *3/00*

U.S. Cl. 93—36.01 **1 Claim**

1. A method of forming a liquid-tight heat-insulated cup comprising the steps of providing a smooth surface inner cup member having a circular bottom and a circular cross-section side wall in liquid-tight relation with said bottom and extending upwardly therefrom; cutting, from a smooth planar sheet, a smooth planar blank, as a starting material, having a width in excess of the peripheral length of said circular bottom and a length substantially equal to the height of said side wall; then uniting the laterally opposite ends of said smooth planar blank in overlapped relation to form a circular cross-section, initially smooth surface, sleeve constituting an outer cup member; after such uniting, thereafter forming parallel, longitudinally extending concavo-convex flutes in said outer cup member to form a structure whose peripheral surface is corrugated longitudinally of said sleeve; and then telescoping said inner cup member into said outer cup member to form a composite liquid-tight cup with heat insulating air passages extending upwardly along the outer surface of the smooth side wall of said inner cup member.

3,908,524

RECORD JACKET MAKING MACHINE

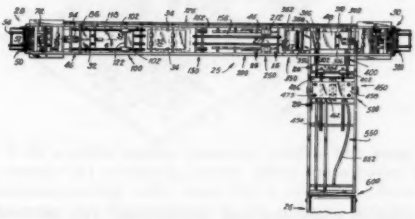
Paul B. Shore, Kings Point, N.Y., assignor to Shorewood Packaging Corporation, Farmingdale, N.Y.

Filed Jan. 4, 1974, Ser. No. 430,950

Int. Cl.² B31B *19/74*

U.S. Cl. 93—62 **24 Claims**

1. A machine for making record jackets having one or two pockets from two paperboard blanks comprising a "T" shaped frame being provided with an elongated carriage and a transverse leg extending therefrom, said elongated carriage having a longitudinal axis with an input at each end thereof and a delivery end on said transverse leg, a first feeding station at one input end of said elongated carriage for feeding a first paperboard blank in one direction along the longitudinal axis thereof, a second feeding station at the other input end of said elongated carriage for feeding a second paperboard blank toward the first paperboard blank, a notching station adjacent said first feeding station for cutting notches in said first paperboard blank, a scoring station adjacent said notching station for cutting score lines in said first paperboard blank, said notches and score lines defining a plurality of glue flaps, a first folding station adjacent said scoring station for folding said glue flaps into a predetermined position, a gluing station adjacent said folding station for applying an adhesive to said glue



flaps, an assembly station disposed between said gluing station and said second feeding station for joining said second paperboard blank to said notched scored and folded first paperboard blank, a transfer station for directing the movement of said joined first and second paperboard blanks onto said transverse leg toward said delivery end thereof, a spining station adjacent said transfer station for forming a spine in said joined first and second paperboard blanks, a second folding station adjacent said spining station for folding said joined first and second paperboard blanks along said spine thereby forming a closed record jacket, said second folding station being positioned before said delivery end where said record jackets are removed, and conveyor means disposed in said elongated carriage and said transverse leg for moving the first and second paperboard blanks from station to station.

3,908,525

COIN WRAPPER FORMING APPARATUS

Victor G. Ristvedt, Rt. 2, Forest Wood Dr., and Roy B. Johnson, 603 Adams St., both of Manchester, Tenn. 37355

Continuation of Ser. No. 227,452, Feb. 18, 1972, Pat. No. 3,830,142. This application Jan. 2, 1974, Ser. No. 429,952

Int. Cl.² B31C *1/02*

U.S. Cl. 93—81 MT **7 Claims**

1. A coin wrapper forming apparatus comprising:

supply means for continuously supplying lengths of paper of a predetermined length and width;

wrapper forming means comprising:

at least one forming member including a fixed non-rotating cylindrical inner wall defining at least one cylindrical cavity, said inner wall having a longitudinal slot adapted to receive the width dimension of a said length of paper, and there being an end opening in said cavity;

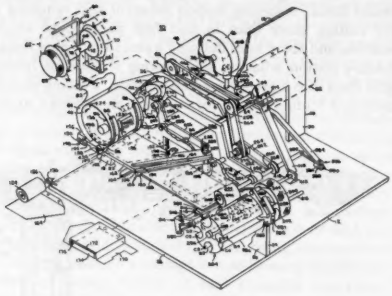
feed means including means for receiving a said length of paper and feeding same through said slot into said cylindrical cavity and around and against said wall for forming a paper cylinder on said wall comprising:

a first roller positioned adjacent said longitudinal slot and about an axis outside of said cylindrical cavity, which axis is parallel to the longitudinal axis of said cylindrical cavity,

means for rotating said first roller, and

a second roller smaller in diameter than said cylindrical cavity adjacent said slot within said cylindrical cavity

about an axis parallel to and spaced from the longitudinal axis of said cavity, said second roller being driven by roller contact with said first roller through the thickness of a said paper as a said length of paper is fed by said first roller between said rollers onto, against, and around the wall of said cavity, forming a wrapper corresponding to the wall of said cavity and larger than the diameter of said second roller;



crimping means operating synchronously with the formation of a said paper cylinder for crimping one end of a said paper cylinder; and

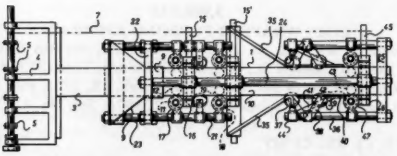
ejection means operating synchronously with the completion of the crimping of a said paper cylinder for ejecting a said paper cylinder from said cavity as a completed coin wrapper.

3,908,526

MACHINE AND METHOD TO PRODUCE FIBERBOARD TUBES OF POLYGONAL CROSS-SECTION

Venizelos Vassalos, 5345 Walkley Ap. 41, Montreal 265, Quebec, Canada

Filed July 8, 1971, Ser. No. 140,357
Int. Cl.² B31F *1/00*
U.S. Cl. 93—82 **3 Claims**



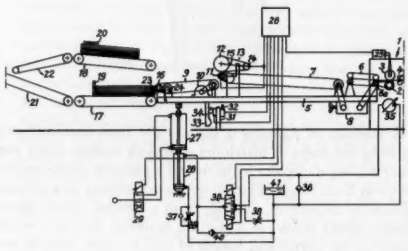
1. A machine for manufacturing tubular products of polygonal cross-section from strips of fiberboard of a width substantially equal to the perimeter of the finished products, said machine comprising an elongated former member of constant cross-sectional size and constant polygonal cross-sectional shape, means to support said former member in stationary position, means to supply a first one of said strips in transversely flat condition in a path longitudinally of, and close to, the exterior of said former member, means to move said first strip along said former member with the central longitudinal portion of said first strip applied against a first face of said former member, means to bend and to apply the remaining longitudinal portions of said first strip against the remaining faces of the said former member, as said first strip is being moved along said former member, so that the edges of said first strip are brought together to form a joint, whereby a first fiberboard tube is produced, means to supply a second one of said strip in transversely flat condition in a path longitudinally of, and close to, the exterior of said former member with the center line of said second strip substantially lying over the joint of said first tube, means to bend and to apply said second strip over the remaining faces of the tube formed by said first strip, so that the edges of said second sheet form a joint along a zone of said first tube remote from said first-named joint and a second fiberboard tube is formed around said first tube, and means to apply glue to the contacting faces of one of said two tubes prior to the forming of said second tube around said first tube, said former member being of tubular construction and further including means to seal the joint of said first tube, said last-named means comprising idle wheels mounted within said tubular former, an endless flexible tape trained on said wheels having one run extending inside said tubular former and the other run passing through slits of a wall of said tubular former and in sliding contact with the outside of said wall to move in register with the joint of said tube and at the speed of said first strip along said former member, and glue applying means coacting with a portion of said tape prior to the applying of said first strip unto said tape.

3,908,527

APPARATUS FOR FORMING LOOSE PACKETS OF FLAT WORKPIECES

Friedrich Franz Brockmuller, and Richard Feldkamper, both of Lengerich of Westphalia, Germany, assignors to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Dec. 12, 1973, Ser. No. 424,074
Claims priority, application Germany, Dec. 13, 1972, 2261005
Int. Cl.² B31B *1/98*
U.S. Cl. 93—93 DP **13 Claims**

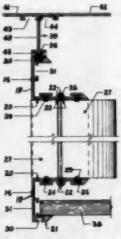


1. Apparatus for forming packets of predetermined numbers of superposed flat workpieces from a row of such workpieces arriving in succession from a workpiece forming apparatus, comprising a movable first belt conveyor located downstream of the forming apparatus operating at a slower conveying speed than the arrival speed of said workpieces to transform the row of workpieces to a flow of workpieces in overlapping formation, brake means downstream from said forming apparatus adjacent the first belt conveyor effective to engage the workpieces and cause same temporarily to build up and interrupt the flow of the overlapping formation each time the predetermined number of workpieces for a packet has been reached, and two packeting stations spaced from one another downstream of the first conveyor each including an abutment means, and means for moving the position of the first belt conveyor relative to the packeting stations so that the overlapping flow is directly alternately to one said station and the other.

3,908,528
DIFFUSERS FOR CONDITIONED AIR

Mannie Bertin, 47 Lenon Dr., Danbury, Conn. 06810, and Ira L. Bertin, Box 25, Limington, Maine 04049

Division of Ser. No. 384,041, July 30, 1973, Pat. No. 3,841,209. This application Apr. 19, 1974, Ser. No. 462,508
Int. Cl.² F24F 7/06, 13/06
U.S. Cl. 98—40 VM 6 Claims

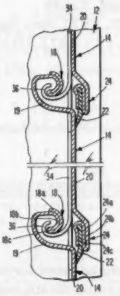


1. A damper-fin assembly for an air diffuser, said assembly comprising a frame including top, bottom and side members that are extrusions and means interconnecting said members, said top and bottom members having a channel extending lengthwise thereof with the channels opening towards each other, a series of damper units, fin units and pivots having ends, the ends of the pivots being removably received in said channels, and discontinuous means in said channels providing spaced sockets holding said pivot ends against movement lengthwise of said channels.

3,908,529
BACKDRAFT DAMPER

Francis J. McCabe, Apt. A-4, North & East Sts., Doylestown, Pa. 18901

Continuation-in-part of Ser. No. 354,680, April 26, 1973, Pat. No. 3,833,989. This application June 5, 1974, Ser. No. 477,068
Int. Cl.² F24F 13/08
U.S. Cl. 98—110 6 Claims

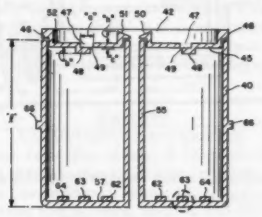


1. In a backdraft damper having a frame, at least one blade, and pivot means for allowing arcuate displacement of said blade with respect to said frame, the improvement wherein said pivot means comprises at least two hook-shaped hinge elements formed in said frame, said hinge elements defining a surface having a hook-shaped cross-section and at least one hook-shaped hinge portion formed in said blade, said hinge portion complementally configured to said hook-shaped hinge elements and slidably engaging said hinge elements, and wherein said pivot means further comprises bearing means disposed between said hinge elements and said hinge portion.

3,908,530
DRIP COFFEE MAKER

Albert E. Simon, Jr., Fort Washington, Pa., and William J. Rakocy, Clifton, N.J., assignors to North American Philips Corporation, New York, N.Y.

Filed Aug. 24, 1973, Ser. No. 391,079
Int. Cl.² A47J 31/02
U.S. Cl. 99—307 8 Claims



1. In a coffee making apparatus operable with water, a receptacle for containing brewed coffee and a basket for containing ground coffee beans that is removably placed in the upper part of said receptacle, the apparatus including a reservoir for containing a quantity of said water, a frame, a base part of said frame for supporting said receptacle, a spout on said frame for delivering water into said receptacle, and means carried by said frame for heating water from said reservoir and flowing same through said spout, the improvement in combination therewith wherein said basket comprises a cylindrical body with an open top end and a bottom end perforated with a plurality of spaced apertures, a spreader plate for covering said top end, said plate perforated with a plurality of apertures formed as slots which are spaced apart from each other, said plate further comprising a rib below and partially closing each slot thus providing a narrow gap for passage of water, said plate having a top surface with a rim extending upward a predetermined height from said surface defining a receiving space within said rim for water from said spout, the plate further including a first overflow aperture having an opening situated above said top surface at a height less than that of said rim, the basket further comprising a second overflow aperture in the bottom end and a duct extending through said body for communicating said second overflow aperture in the bottom end with said first overflow aperture in the spreader plate, whereby water in the receiving space at the height above the opening in said first overflow aperture will flow through the said first aperture and duct without contacting ground coffee in said basket.

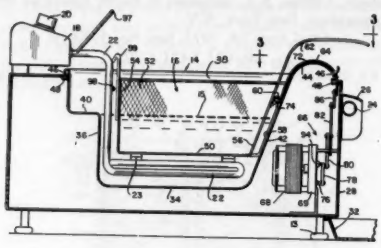
3,908,531
AUTOMATIC FRENCH FRYER

Fred W. Morley, c/o Rotamation Inc., 1450 N. Pershing Ave., Indianapolis, Ind. 46222

Filed Apr. 2, 1974, Ser. No. 457,194
Int. Cl.² A47J 37/12
U.S. Cl. 99—336 18 Claims

1. An automatic French fryer comprising a tank for containing a pool of hot cooking oil; a basket for containing food to be cooked and having a cooking position in the tank for submerging the food in the pool of oil; a cooked-food receiver outside said tank; support means for supporting the basket in a dumping position relative to said receiver, power-drive lift means having a disengageable connection with the basket and having an operating cycle in which it lifts the basket to a drainage position over the tank and thereafter tips of basket outward from above the tank to its dumping position over the receiver to empty the food from the basket to the receiver, and then disengages the basket and returns to its starting

position, leaving the basket supported by said support means in said dumping position; and means to automatically activate



said lift means for operation through its operating cycle when the food is cooked done.

3,908,532

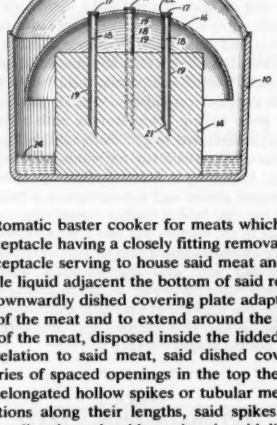
AUTOMATIC BASTER COOKER

Paul W. Underwood, 505 W. 14th St., Chicago Heights, Ill. 60411

Filed Sept. 30, 1974, Ser. No. 510,587

Int. Cl.[2] A47J *37/10, 37/04*

U.S. Cl. 99—347 **8 Claims**



1. An automatic baster cooker for meats which includes a cooking receptacle having a closely fitting removable lid, said cooking receptacle serving to house said meat and a layer of a vaporizable liquid adjacent the bottom of said receptacle, a generally downwardly dished covering plate adapted to overlie the top of the meat and to extend around the sides of the upper part of the meat, disposed inside the lidded receptacle in spaced relation to said meat, said dished covering plate having a series of spaced openings in the top thereof, and a plurality of elongated hollow spikes or tubular members having perforations along their lengths, said spikes or tubular member extending through said openings in said dished covering plate and extending downwardly from said dished covering plate and penetrating into the body of said meat.

3,908,533

APPARATUS FOR CONTINUOUSLY COOKING FOOD IN SEQUENTIAL OVEN SECTION OF AN ELONGATED OVEN

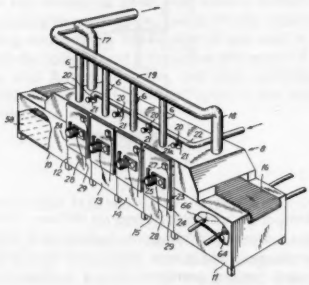
Kurt Gunnar Fagerstrom; Bertil Henry Goransson, both of Alingsas, and Per-Olov Hellstrom, Malmo, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Apr. 4, 1973, Ser. No. 347,691

Int. Cl. A47J *37/08;* **A23I** *3/00*

U.S. Cl. 99—386 **7 Claims**

1. Apparatus for continuously cooking foods in a sequential arrangement comprising an elongated oven having a plurality of oven sections arranged in tandem, a conveying means for transporting the foods sequentially through each of the oven sections, a gaseous medium in each oven section, fan and heating members in each oven section for circulating said gaseous medium over the foods on the conveying means in circulation paths that are substantially transverse to the path of movement of said conveying means, first guide members in the circulation paths for causing said heated gas to flow over the foods on the conveying means in two separate paths in which one path is above the conveying means and the other path is below said conveying means, each of said oven sections



being provided with an oven insert having second guide members, said second guide member causing a turbulent flow of gas above and below said conveying means, said oven insert being further provided with a box-like structure positioned adjacent to the conveying means and having a long slit extending substantially parallel to the plane of the conveying means and forming an inlet opening for the circulating gas, and an opening in said box-like structure aligned with said slit forming an outlet for the gas and communicating with the inlet of the fan.

3,908,534

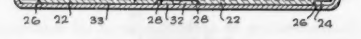
FRYING PAN HEAT TRANSFER PLATE

Denzil O. Martin, 16222 Monterey Ln., Space No. 83, Huntington Beach, Calif. 92649

Filed June 28, 1972, Ser. No. 267,128

Int. Cl.[2] A47J *37/10*

U.S. Cl. 99—418 **10 Claims**

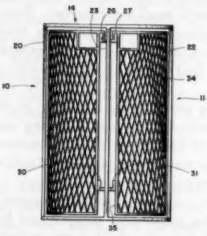


1. A heat transfer plate adapted for use in a frying pan, or the like, comprising an imperforate metal plate having high heat conductivity and having a flat top surface extending to its outer periphery and a bottom surface, a plurality of radially disposed ribs integral with and depending from said bottom surface, said bottom surface being flat between said ribs, the lowermost surfaces of all of said ribs being equidistant from said bottom surface of said plate throughout the lengths of said ribs, whereby all of said ribs are adapted to rest on the bottom of said pan, said ribs extending outwardly to a position such that the outer ends of said ribs are adjacent to the outer periphery of said plate, and extending inwardly to a position such that the inner ends of said ribs are disposed short of the axis of said plate, said heat transfer plate being devoid of any portions projecting below said lowermost surfaces.

3,908,535
APPARATUS FOR RECEIVING ARTICLES FOR IMMERSION INTO A FLUID FOR COOKING

Jerry Dale Gordon, 10765 E. 11th St., Tulsa, Okla. 74119

Filed Jan. 14, 1974, Ser. No. 432,986
Int. Cl.[2] A47J *43/18*
U.S. Cl. 99—426 2 Claims



1. A container for receiving items for immersion in a cooking fluid, comprising:

a frame, including upper and lower circular shaped frames, a plurality of rods interconnecting said upper and lower circular shaped frames spacing said upper and lower circular shaped frames apart, and two pair of parallel rails, attached between a pair of said rods, said two pairs of rails each pair being disposed mutually parallel, one being located near a top portion of said rods, the other being located adjacent a bottom portion of said rods;

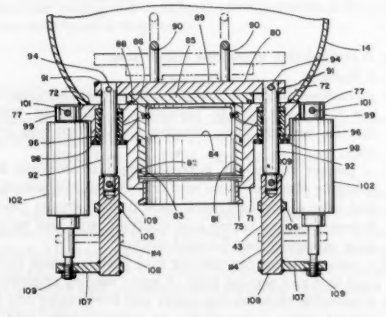
a pair of baskets of semicircular cross-section shape having a straight side and a curved side of radius approximately equal to a radius of said upper and lower circular shaped frames;

a pair of channels each attached to a respective one of said baskets, upon the straight side adjacent a top portion thereof, said channel slidably receiving one of said rails of said pair of rails adjacent the top portion of said rods, said bottom located pair of rails bearing upon a bottom portion of said baskets to present horizontal support therefor.

3,908,536
VACUUMIZING APPARATUS WITH INTERNAL FLOW CONTROL VALVE

Miles S. Bajcar, Palos Hills, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Filed Oct. 9, 1974, Ser. No. 513,206
Int. Cl.[2] A22C *17/00*
U.S. Cl. 99—472 10 Claims

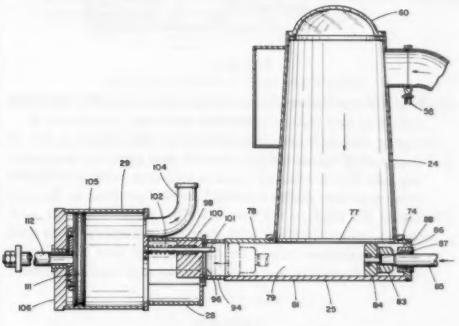


1. In a vacuumizing apparatus which is adapted to remove air from a meat emulsion, of the type comprising: a hopper for storing the meat emulsion, a vacuum chamber adapted to be connected to a source of vacuum, a conduit connecting said chamber and hopper for the passage therethrough of the meat, a pumping chamber connected to said vacuum chamber, a piston adapted to be connected to a source of power and mounted for reciprocation in said pumping chamber, a stuffer in communication with said pumping chamber with a check valve assembly therebetween, and means for moving the meat pumped into said stuffer by said pump piston out of said stuffer, wherein the improvement comprises: a valve movably mounted in said vacuum chamber in communication with said conduit to control the flow of meat through said conduit into said vacuum chamber and means for actuating said valve.

3,908,537
VACUUMIZING APPARATUS

Miles S. Bajcar, Palos Hills; Robert H. Marshall, Hinsdale, and William M. Allen, Indian Head Park, all of Ill., assignors to Chemetron Corporation, Chicago, Ill.

Filed Oct. 9, 1974, Ser. No. 513,205
Int. Cl.[2] A22C *17/00*
U.S. Cl. 99—472 10 Claims



1. In a vacuumizing apparatus, which is adapted to remove air from a meat emulsion, of the type comprising: a hopper for storing the meat emulsion, a vacuum chamber adapted to be connected to a source of vacuum, a conduit connecting said chamber and hopper, valve means in said conduit for controlling the meat flow to the vacuum chamber, a pumping chamber connected to said vacuum chamber, a stuffer connected to said pumping chamber with a check valve assembly therebetween and means for moving the meat pumped into the stuffer out of said stuffer, wherein the improvement comprises: said vacuum chamber having an annular, downwardly diverging wall and said pumping chamber having a generally rectangular configuration located transverse to and below said vacuum chamber for receiving meat from same, and a rectanular piston which is adapted to be connected to a source of power, mounted for reciprocation in said pumping chamber.

3,908,538
JAM-PROOF TRASH COMPACTOR

John A. Boyd, 3314 Holloman Rd., Falls Church, Va. 22042

Filed Nov. 30, 1973, Ser. No. 420,582
Int. Cl.[2] B30B *15/18*
U.S. Cl. 100—49 11 Claims

1. A trash compacting apparatus comprising:

first means for defining a first chamber having a top opening and a side opening;

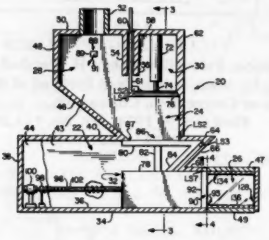
second means, coupled to said first means, for defining a second chamber located above and directly communicating with said first chamber through said top opening;

third means, coupled to said first means, for defining a third chamber located on one side of and directly communicating with said first chamber through said side opening;

a carriage assembly longitudinally movable through said first chamber between a first position wherein a first portion of said carriage assembly fills said top opening and a second portion of said carriage assembly fills said side opening, and a second position wherein said first and second portions are spaced from said openings;

chute means, coupled to said second chamber, for delivering trash into said second chamber;

compaction means, located in said second chamber, for compressing trash against said first portion of said carriage assembly when said carriage assembly is in said first position;



power means for moving said carriage assembly between said first and second positions; and

scraping means, located adjacent said top opening and in contacting relationship with said first portion, for scraping said first portion of trash as said first portion is moved from said first position to said second position to thereby cause the trash to fall into said first chamber;

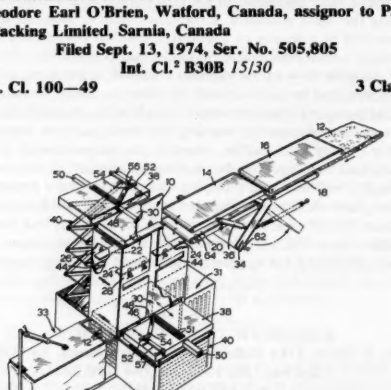
whereby movement of said carriage assembly from said second position causes the trash in said first chamber to be transferred to and compacted in said third chamber.

3,908,539

APPARATUS FOR AUTOMATICALLY STACKING AND COMPRESSING BATTS OF COMPRESSIBLE MATERIAL

Theodore Earl O'Brien, Watford, Canada, assignor to Patco Packing Limited, Sarnia, Canada

Filed Sept. 13, 1974, Ser. No. 505,805
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—49 **3 Claims**



1. Apparatus for stacking and compressing batts of compressible material comprising:

i. a vertical stacking chamber,

ii. indexing gates in the upper portion of said stacking chamber normally disposed to receive batts,

iii. an indexing and compression plate,

iv. means for repeatedly cycling said indexing and compression plate around a first path a predetermined number of times and then around a second path once,

v. said first path extending upwardly of the outside said stacking chamber laterally into said stacking chamber at a level above said indexing gates, downwardly in said stacking chamber, through said indexing gates, and laterally out of said stacking chamber, said second path extending upwardly of the outside said stacking chamber, laterally into said stacking chamber, downwardly in said stacking chamber to a compression level in the lower portion thereof that is below the extent of downward travel of said first path and laterally out of said stacking chamber,

vi. said indexing gates being operable in response to the passage therethrough of said indexing and compression plate to permit said indexing and compression plate to carry batts thereon to the portion of said stacking chamber therebelow,

vii. an ejection passage extending across said stacking chamber at the lower end thereof and below said compression level through which batts underlying said index and compression plate at the compression level can be laterally removed from said stacking chamber,

viii. means for ejecting batts underlying said indexing and compression plate when said indexing and compression plate is at said compression level,

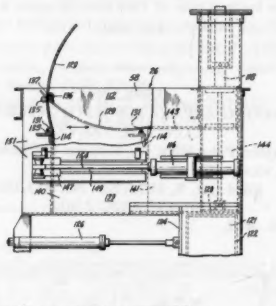
ix. said means for repeatedly cycling said indexing and compression plate being adapted to remove said compression plate out of said stacking chamber on said second path after operation of said means for ejecting batts.

3,908,540

MOBILE COMPACTING APPARATUS

Harold L. Broman, Kenmore, N.Y., assignor to Sno Pac Corporation, Tonawanda, N.Y.

Filed Oct. 20, 1972, Ser. No. 299,587
Int. Cl. B30b *15/30*
U.S. Cl. 100—215 **7 Claims**



1. A compacting apparatus comprising:

a. a housing;

b. a charging chamber in said housing, said charging chamber being adapted to receive a quantity of material therein, said charging chamber having first and second ends;

c. a pusher means for pushing material received in the charging chamber from said first end to said second end and into a confined area; said pusher means having a forward surface facing said confined area and an upper edge adjoining said forward surface;

d. a power means for moving said pusher means between said first and second ends of said charging chamber;

e. a movable plate having upper and lower sides and being curved along substantially its entire length, said plate being pivotally coupled to said pusher means in the region of said upper edge thereof;

f. a straight elongated member disposed in said housing above said pusher means and adjacent said first end of said charging chamber, said elongated member being transversely arranged with respect to the direction of movement of said pusher means, the longitudional axis of said member being fixed with respect to said housing;

g. said lower side of said curved closure plate engaging said elongated member at all positions of said pusher means, said closure plate being supported from below by said member and movable with respect to said member;

h. whereby said closure plate prevents material from being deposited behind said pusher means and is capable of accommodating build-up of relatively heavy material thereabove, thereby facilitating substantially continuous reception of material.

3,908,541

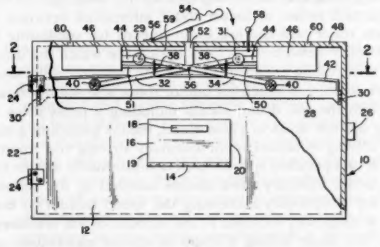
CRUSHING DEVICE FOR HOUSEHOLD WASTES

Rolf W. Meidell, Mimico, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 3, 1974, Ser. No. 485,510

Int. Cl.² B30B *15/30, 1/38*

U.S. Cl. 100—215 **4 Claims**



1. A device for crushing and compacting refuse comprising, in combination, a container including a side door hinged thereto, and a top trap door in said side door for introducing refuse in said container; a slidable ram head vertically movable in said container; ball bearings mounted along the periphery of said head for facilitating vertical movement thereof in said container; a pair of pivoted arms having rollers at their lower ends adapted to roll on the top of said ram head; straps holding said rollers on said head; cylinders connected to the upper ends of said arms for pushing said rollers against said head to lower same and to crush refuse in said container; a pump operatively connected to said cylinders; return means stretched between said arms for normally urging said arms together for raising said ram head when pressure of said cylinders on said head is stopped.

3,908,542

SYSTEM FOR PRINTING ON A MOVING WEB

P. Leonard Andersson, Paoli, Pa., assignor to Roberts Numbering Company, Brooklyn, N.Y.

Filed Dec. 26, 1974, Ser. No. 536,457

Int. Cl.² B41J *9/26*

U.S. Cl. 101—79 **7 Claims**

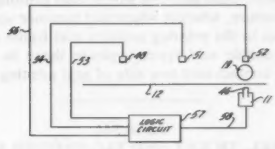
1. A system for generating an actuation signal for activating a hammer in a machine for printing predetermined indicia at preselected locations on a moving web; said system including:

first means for sensing when said preselected locations are at a first position with respect to said machine to provide a first position signal;

second means for sensing when said preselected locations are at a second position with respect to said machine to provide a second position signal;

third means for generating a clock signal;

an up-down counter responsive to (1) said first position signal for counting said clock signal in a first direction and (2) said second position signal for counting said



clock signal in a second direction opposite from said first direction; and

fourth means responsive to said up-down counter reaching a predetermined count while counting in said second direction for providing said actuation signal.

3,908,543

DATING DEVICE FOR PRINTERS

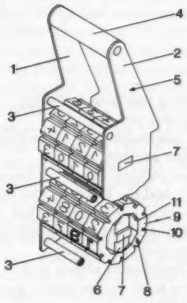
Johannes Wirth, Zurich, Switzerland, assignor to Wirth, Gallo & Company, Zurich, Switzerland

Filed Nov. 5, 1973, Ser. No. 412,959

Claims priority, application Switzerland, Mar. 16, 1973, 3837/73

Int. Cl.² B41J *1/22*

U.S. Cl. 101—110 **2 Claims**



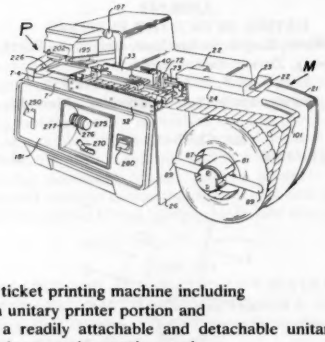
1. A printer, comprising: a printing plate having a plurality of sides forming an aperture extending from a front face of said plate a predetermined distance into said plate to one of said sides which substantially parallel to said front face, and a groove extending along another of said sides; a dating device, detachably connected inside said aperture to said printing plate, including a frame having means which is slidably engaged in said groove to slide backward and forward between said front face and said one side, an axle connected to said frame having a polygonal cross-section with two opposite first edges, type wheels, of an elastically deformable material, each having a polygonal inner cross-section with a plurality of second edges spaced apart by a plurality of sides, said wheels being rotatably mounted on said axle and in which two of said second edges of said wheels rest on said two opposite first edges of said axle, the distance between said two opposite first edges being greater than the distance between any two opposite sides of said polygonal inner cross-section, wherein when said wheels are rotated on said axle said inner cross-section is deformed by one of said two opposite first edges; and a mov-

able hammer, located opposite said front face of said printing plate, for applying a force to said dating device; said dating device further including types on the periphery of said type wheels, some of said types being in a printing position facing said hammer and projecting ahead of said front face in a direction towards said hammer, and types on said type wheels opposite said types in the printing position being at a predetermined distance from said one side of said printing plate forming said aperture, wherein when said hammer applies a force to said types in the printing position said frame slides in said groove to enable said types opposite those in the printing position to contact said one side of said printing plate.

3,908,544
LABEL, TICKET AND TAG PRINTER WITH INTERCHANGEABLE TAPE SUPPLY AND FEEDING MAGAZINE

Maximilian R. Seidl, Munich; Joachim Seidl, Eching, both of Germany, and Walton M. Henry, Rydal, Pa., assignors to Avery Products Corporation, San Marino, Calif.

Filed July 9, 1973, Ser. No. 377,830
Int. Cl.² B41F *1/08*
U.S. Cl. 101—292 **11 Claims**

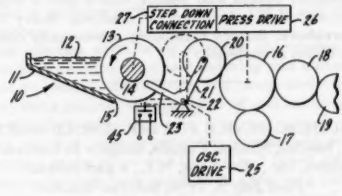


1. A ticket printing machine including
(P) a unitary printer portion and
(M) a readily attachable and detachable unitary ticket-feeder magazine portion, and
(Q) means for permitting the quick interconnection of the printer portion and the ticket-feeder magazine portion in operative juxtaposition to each other and for permitting the quick disconnection of said portions from each other, said printer portion (P) including
(P-1) a print-impression platen and
(P-2) a printer-head in operative, juxtaposition thereto for carrying type, and
(P-3) cyclical ticket-feeder drive-means adapted for operative engagement with the below-mentioned driven member (M-5),
said ticket-feeder magazine (M) including
(M-1) a ticket-supply holder and
(M-2) a ticket-feeder arranged intermittently to feed successive tickets from said ticket-supply-holder to said print-impression platen, and
(M-3) means for longitudinally adjusting said ticket-feeder so as to locate the successive tickets fed thereby in operative juxtaposition to the type carried by said printer-head, and
(M-4) lateral-guiding means and means for permitting the lateral adjustment thereof for laterally locating the tickets in operative alignment with the type carried by said printer-head, and
(M-5) a driven member associated with said ticket-feeder and arranged for operative engagement with the aforementioned ticket-feeder drive-means (P-3) when the ticket-feeder magazine portion is operatively interconnected with the printer portion.

3,908,545
INKING SYSTEM WITH MEANS FOR AUGMENTING TRANSFERRED INK

Claus Simeth, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG

Filed Aug. 5, 1974, Ser. No. 494,993
Claims priority, application Germany, Aug. 9, 1973, 2340300
Int. Cl.² B41F *31/06, 31/10*
U.S. Cl. 101—350 **1 Claim**



1. In a printing press, the combination comprising an ink fountain having a fountain roller with means for depositing a relatively thick film of ink thereon, an ink drum spaced from the fountain roller, a ductor roller interposed between the fountain roller and the ink drum, means for oscillating the ductor roller between a pick-up position in which the ductor roller is in rolling engagement with the fountain roller and a transfer position in which the ductor roller is in rolling engagement with the ink drum, means including a press drive for driving the ink drum at press speed, means including a step-down driving connection for normally driving the fountain roller at an operating speed which is substantially slower than press speed, auxiliary drive means coupled to the fountain roller for temporarily increasing the speed thereof to bring about a temporary increase in the amount of ink transferred to the ink drum during a cycle of ductor movement, and control means temporarily actuatable by the press operator for energizing the auxiliary drive means thereby to increase rate of ink feed to facilitate the making of proof copies during initial adjustment and start-up of the press, the control means including an interlock switch effectively connected in series therewith and having an operating connection to the ductor roller so that the increase in speed of the fountain roller is limited substantially to that interval in which the ductor roller is in rolling engagement with the fountain roller, the fountain rather being continuously driven and the control means for temporarily energizing the auxiliary driving motor being independent of press speed.

3,908,546
PLATE CLAMPING MECHANISM FOR PRINTING CYLINDER

Clive Porter, York, Pa., assignor to Motter Printing Press Co., York, Pa.

Continuation of Ser. No. 297,920, Oct. 16, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,243
Int. Cl.² B41F *27/10*
U.S. Cl. 101—378 **1 Claim**

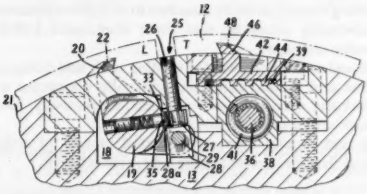
1. A clamping mechanism for securing a printing plate to a printing cylinder comprising, in combination:
a. first lock-up means, arranged in a longitudinal groove in the printing cylinder, for securing the leading side of a printing plate to the printing cylinder, comprising:
i. a monolithic member arranged in the longitudinal groove and pivoted for rotation about an axis offset from and parallel to the axis of the printing cylinder, said monolithic member having two register fingers each protruding above the surface of the printing cylinder and arranged to engage the printing plate in a corresponding recess in the underside of the printing

plate, there being two such recesses at the leading side of the printing plate;

ii. resilient means for biasing said monolithic member in a direction of rotation tending to release said register fingers from engagement in the recesses of the printing plate; and

iii. screw means for applying a positive force to said monolithic member in a direction of rotation tending to engage said register fingers with the printing plate in the recesses of the printing plate, said screw means being accessible for rotation from the surface of the printing cylinder and being adjustable, upon rotation, to vary the position of said register fingers; and

b. second lock-up means, arranged in a longitudinal groove in the printing cylinder, for securing the trailing side of a printing plate to the printing cylinder, comprising:



i. an actuating rod arranged in the longitudinal groove along an axis offset from and parallel to the axis of the printing cylinder and movable axially between a plate clamping and a plate releasing position, said actuating rod being threaded along at least a portion of its length;

ii. a plurality of actuating blocks, disposed at intervals along said actuating rod, and having engaging surfaces on the outer side thereof extending substantially radially with respect to the printing cylinder and angled with respect to the axis of the printing cylinder, said actuating blocks being provided with a bore of sufficient diameter to accommodate said actuating rod in non-engaging relationship;

iii. resilient means connecting said actuating rod with each of said blocks to thereby urge said blocks in an axial direction when said actuating rod is in said plate clamping position;

iv. a plurality of finger blocks each having a clamping finger protruding above the surface of the printing cylinder and arranged to engage the printing plate in a corresponding recess in the underside of the printing plate, each finger block being associated with and arranged adjacent to said outer side of one of said actuating blocks, and each finger block having engaging surfaces on the inner side thereof extending substantially radially with respect to the printing cylinder and angled with respect to the axis of the printing cylinder, said engaging surfaces of said finger blocks being disposed in facing relation to respective ones of the engaging surfaces of the associated actuating blocks to thereby move said finger blocks in a direction tending to engage said clamping fingers with the printing plate in corresponding recesses in the underside of the printing plate when said actuating blocks are urged in said axial direction;

v. means accessible from the surface of the printing cylinder for moving said actuating rod between said plate clamping and said plate releasing positions;

vi. a plurality of nuts disposed at intervals along the length of and in threaded engagement with said actuating rod, one nut being disposed adjacent one side of each actuating block to position said actuating block along said actuating rod when said actuating rod is in the plate releasing position, and one nut being disposed adjacent each resilient means to tension said resilient means at least when said actuating rod is in the plate clamping position; and

vii. spacer means, disposed in the bore of each actuating block and extending between the nuts on opposite sides thereof, for establishing a fixed distance between said nuts on the opposite sides of the actuating block, the length of said spacer means thereby determining the preload tension on said resilient means.

3,908,547

HYDROPHILIZING SOLUTION FOR ELECTROPHOTOGRAPHIC IMAGES

Jurgen Rochlitz, Wiesbaden, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 72,146, Sept. 14, 1970, abandoned, which is a division of Ser. No. 800,764, Feb. 19, 1969, abandoned. This application Mar. 16, 1972, Ser. No. 235,378

Claims priority, application Germany, Feb. 22, 1968, 1622360

Int. Cl.² B41N *3/08;* **C08L** *61/24*

U.S. Cl. 101—465 **4 Claims**

1. A process for hydrophilizing the non-image areas of an electrophotographically-produced printing master which comprises treating the master with a hydrophilizing solution which comprises

a. water,

b. at least one bivalent metal salt selected from the group consisting of water-soluble acetates, nitrates, chlorides, and formates of copper, cobalt, nickel, manganese and iron, said bivalent metal salt being used in a concentration in the range of about 1 to 10 per cent by weight, calculated on the weight of total aqueous solution,

c. at least one easily hydrolyzable metal salt selected from the group consisting of iron (III) chloride, aluminum chloride (cryst.), cerium (III) ammonium nitrate, cerium (IV) ammonium sulfate, cerium (III) nitrate, aluminum potassium sulfate, chromium (III) nitrate, iron (III) nitrate, bismuth nitrate and cobalt (III) chloride, said easily hydrolyzable metal salt being used in a quantity in the range of about 10 to 150 per cent by weight, calculated on the weight of the bivalent metal salt, and

d. a water-soluble urea-formaldehyde resin curable by a bivalent metal salt, said resin being present in a quantity in the range of about 5 to 25 per cent by weight, calculated on the weight of the total aqueous solution.

3,908,548

BUOYANCY SYSTEM

Leon E. Wedding, 3813 17th St., N.E., Washington, D.C. 20018

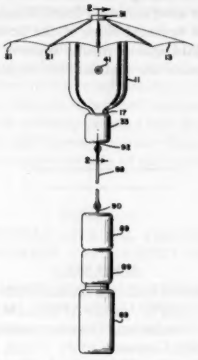
Filed Sept. 30, 1975, Ser. No. 292,593

Int. Cl.² F42B *22/10*

U.S. Cl. 102—13 **3 Claims**

1. A gas generator for use with a submersible buoyancy system comprising a cup having a top, a bottom and side walls, said top containing an opening adapted to be attached to the buoyancy system, a vent tube extending through said bottom to the proximity of said top, and a chemical liberating a gas by

reaction with water packed between said side walls, said vent tube and said bottom, whereby water reaching said chemical



through said vent tube liberates gas to block further entrance of water until the reaction with said chemical declines.

3,908,549

EXPLOSIVE FUSE-CORD

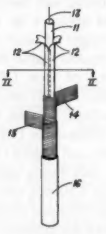
Trevor John Turner, Ardrossan, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 24, 1973, Ser. No. 391,513

Claims priority, application United Kingdom, Sept. 6, 1972, 41356/72

Int. Cl.² C06C 5/04

U.S. Cl. 102—27 R **13 Claims**



1. An explosive fuse-cord comprising a core of water desensitisable explosive material surrounded by at least one layer of textile material and a tape comprising a layer of hot melt adhesive composition on a supporting substrate wrapped immediately around said core, said hot melt adhesive forming a tubular continuous layer disposed between said core of explosive material and said layer of textile material.

3,908,550

ONE HAND OPERABLE DISTRESS SIGNAL

Bobby D. Beatty, Bloomington; Stanley J. Herold, Switz City; Donald E. LaGrange, Washington, and David K. Sanders, Bloomington, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1974, Ser. No. 459,768

Int. Cl.² F42B 4/20

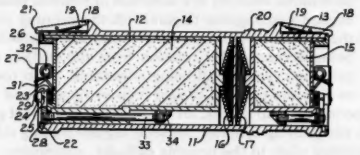
U.S. Cl. 102—37.4 **4 Claims**

1. A hand-held signaling device comprising,

an outer container opened at both ends,

first and second inner containers within said outer container, said first container having a smoke composition therein and being extendable through one end of said outer container, and said second container having a flare composition therein and being extendable through the other end of said outer container,

first and second springs for extending portions of said first and second inner containers, respectively, outwardly from said outer container,



latching means pivotally attached to said outer container for releasably retaining said inner containers within said outer container,

first and second primers for igniting each said composition,

first and second firing pins pivotally connected to said first and second inner containers, respectively, for detonating said primers, and

first and second manually-actuated means for triggering said first and second firing pins, respectively.

3,908,551

PROXIMITY FUSE

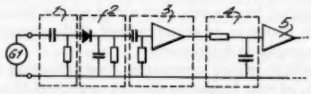
Bjorn Dahl, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrikk, Kongsberg, Norway

Filed Dec. 28, 1973, Ser. No. 429,286

Claims priority, application Norway, Jan. 3, 1973, 26/73

Int. Cl. F42c 11/04

U.S. Cl. 102—70.2 G **5 Claims**



1. A proximity fuse for high trajectory weapons, comprising: ram driven generator means for generating a supply voltage; electronic circuit means for controlling the proximity functions of said fuse, said electronic circuit means being driven by said supply voltage; detector means for receiving said supply voltage and for detecting the increase or decrease in the frequency thereof; and blocking means operated by said detector means for generating a blocking signal for blocking the supply voltage to the electronic circuit means, said blocking means generating said blocking signal upon receipt of a signal from said detector means upon the detection thereby of a decreasing frequency in said generated supply voltage, said blocking signal being terminated when an increasing frequency is detected.

3,908,552

FUZE SIGNAL PROCESSING CIRCUIT

John O. Dick, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

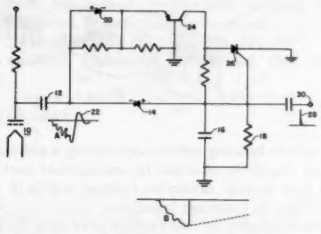
Filed July 7, 1964, Ser. No. 380,957

Int. Cl.² F42C 13/02

U.S. Cl. 102—70.2 P **1 Claim**

1. In a fuze system having an infrared detector means and a firing circuit means, the improvement comprising a processing circuit that is not influenced by the high degree of modulation present in the signals from said detector means as the result of said detector scanning a jet engine exhaust plume, said processing circuit comprising:

a. an input terminal connected to and to receive an input signal proportional to infrared energy received from said infrared detector means as the jet engine exhaust plume is scanned by said detector,
b. a first diode coupled to said input terminal and being polarized to pass a negative going and to block positive signals,
c. a storage capacitor coupled to said diode and being charged to peak amplitude of said input signal,



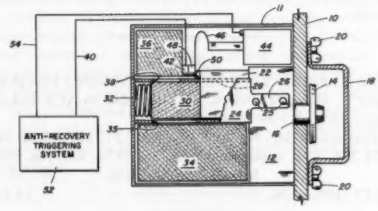
d. an output terminal connected to said firing circuit means,
e. a normally closed gate circuit coupled across said storage capacitor and coupled to said output terminal,
f. a second diode coupling said input terminal to said gate circuit and being polarized to pass a positive voltage to open said gate circuit and discharge said storage capacitor in response to a positive overshoot at the termination of said input signal.

3,908,553

ANTI-RECOVERY DEVICE DISARMING MECHANISM

Eugene H. Beach, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 3, 1969, Ser. No. 855,470
Int. Cl.² F42C *11/00*
U.S. Cl. 102—70.2 R **4 Claims**



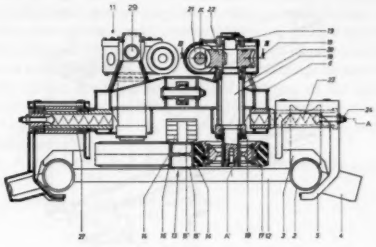
1. A disarming mechanism for an anti-recovery device for an ordnance device comprising:
a combination lock mechanism
cam means coupled to said lock mechanism and actuated thereby from a first position to a second position;
an elongated housing secured to said lock mechanism and partially enclosing said cam means;
detonator means slideably disposed within said housing;
biasing means mounted within said housing for urging said detonator means into engagement with said cam means for motion therewith; and
explosive charge means mounted adjacent said housing, said explosive charge means being juxtaposed to said detonator means when said cam is in said second position and separated from said detonator means when said cam is in said first position.

3,908,554

SELF-PROPELLED AMUSEMENT-PARK RAIL VEHICLE

Anton Schwarzkopf, Munsterhausen, Germany, assignor to Firma Anton Schwarzkopf, Munsterhausen, Germany

Filed Mar. 27, 1974, Ser. No. 455,320
Claims priority, application Germany, Nov. 15, 1973, 2357156
Int. Cl.² A63G *21/04*
U.S. Cl. 104—53 **7 Claims**



1. A self-propelled amusement-park vehicle adapted to ride on a pair of stationary parallel running rails and to propel itself on a stationary drive rail between said running rails, said vehicle comprising:
a housing;
support wheels on said housing engageable with said running rails permitting said housing to roll therealong;
a pair of angularly displaceable drive arms flanking said drive rail, each arm having a lower end adjacent said drive rail and an upper end said lower end displaceable angularly with respect to its upper end;
respective means defining a respective pivot between said housing and each of said upper ends for displacement of the respective lower end laterally toward and away from said drive rail, said pivots being parallel to said drive rail;
a respective drive wheel at each of said lower ends and rotatable about an axis transverse to said drive rail;
a respective spring bearing on each arm for urging the respective lower end toward said drive rail and thereby pressing said drive wheels against said drive rail;
a respective right-angle drive mounted wholly on each of said arms and having an output at the respective lower end carrying the respective drive wheel and an input at the respective upper end; and
a motor in said housing connected to said inputs for rotating said wheels with said drives to propel said housing along said running rails.

3,908,555

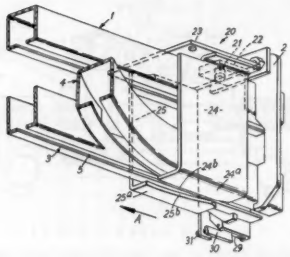
CONVEYOR TRACK SWITCH

Thomas A. Henderson, Inglewood, and Arthur Lee Hamill, Northridge, both of Calif., assignors to Hytrac Conveyors Limited, England

Filed Feb. 22, 1974, Ser. No. 444,729
Int. Cl.² B65G *17/44*
U.S. Cl. 104—130 **8 Claims**

1. In a conveyor system of the kind comprising: a main trackway having a continuous longitudinal slot in its base; a branch trackway of the same cross-sectional shape as the main trackway; a plurality of load carriers which are freely movable in the trackway; and guide elements on the carriers which project through said longitudinal slot and below the trackway, a track switch comprising: a frog connected between the main and branch trackways and having in its base, slots which merge with said slots in the trackways; a load carrier diverter mounted externally of the frog for action on portions of the carrier guide elements which project below the base of the frog, the diverter being pivotally movable between a "straight-through" position in which the load carriers are unaffected

and travel straight through the switch, and a divert position in which the diverter acts on the said portions of said carrier guide elements projecting below the frog to divert the trolleys into the said branch trackway; and means for moving the diverter between said straight-through and divert positions,



said diverter comprising an assembly formed by a carrier plate mounted above the frog to pivot about a vertical axis passing through the latter, and a pair of side plates which depend from the carrier plate at opposite sides of the frog and which have inwardly-directed bottom marginal portions, the opposed edges of which form guide edges.

3,908,556

SLEDDING SYSTEM

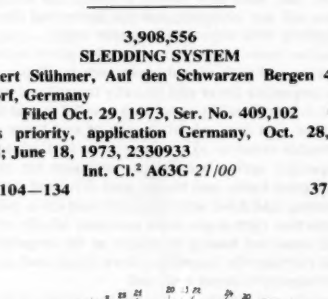
Rolfherbert Stühmer, Auf den Schwarzen Bergen 4, 2101 Ehestorf, Germany

Filed Oct. 29, 1973, Ser. No. 409,102

Claims priority, application Germany, Oct. 28, 1972, 2253055; June 18, 1973, 2330933

Int. Cl.[2] A63G *21/00*

U.S. Cl. 104—134 **37 Claims**



1. A sledding system, comprising a track including support means defining a sledding path, and a plurality of glide elements carried by said support means and having exposed faces which together form a sledding surface, said glide elements being at least at said faces of a first material selected from the group composed of polyethylene, fluoro-containing polyalkylene, polymethylene-oxide, polyester, melamine resin and cold-rolled rust-free steel; and at least one sled having runners provided with sledding-surface engaging portions of a second material different from said first material and selected from the group composed of fluoro-containing polyalkylene, polymethyleneoxide and polyethylene.

3,908,557

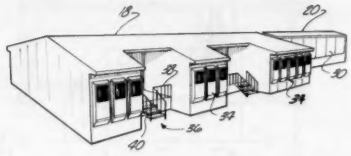
MOBILE HOUSING SYSTEM

Christopher Z. Wzacny, 295 N. Glengarry, Birmingham, Mich. 48010

Filed May 23, 1974, Ser. No. 472,625

Int. Cl.[2] B61D *1/00*

U.S. Cl. 105—329 R **5 Claims**



1. A mobile housing system comprising a plurality of railroad cars releasably attached to one another such that said railroad cars may be driven on railroad tracks in a conventional manner to a storage location;

a selected number of said railroad cars each having a core section and expandable side wall sections;

partitions dividing the core sections and the side wall sections of each car into a plurality of dwelling units;

each of said selected number of cars having a separate mechanical section for distributing electrical, mechanical, and plumbing facilities via said core sections to each of the dwelling units therewithin;

a service car having power generating, waste disposal and water supply means;

releasable coupling means associated with all of said railroad cars for interconnecting said electrical, mechanical, and plumbing facilities contained within the mechanical sections of each car with said service car when said cars are at said storage location such that said facilities of said cars may be interconnected to the self-contained utility generating source in said service car;

means connecting said service car to a public utility source for bypassing said self-contained utility generating means in said service car when said public source is available; and

said coupling means being disconnected with said cars are driven on said railroad tracks in said conventional manner.

3,908,558

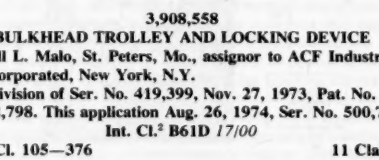
BULKHEAD TROLLEY AND LOCKING DEVICE

Lowell L. Malo, St. Peters, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 419,399, Nov. 27, 1973, Pat. No. 3,872,798. This application Aug. 26, 1974, Ser. No. 500,786

Int. Cl.[2] B61D *17/00*

U.S. Cl. 105—376 **11 Claims**



1. A bulkhead assembly for a transportation vehicle comprising: fixed rail assemblies adapted to be mounted upon a fixed upper portion of opposite sides of the vehicle; said rail assemblies each having a longitudinally extending rail having a rail contour which cooperates with a contour on a rotatable bulkhead trolley; said bulkhead trolleys rotatably mounted upon a hollow member mounted on a bulkhead adapted for longitudinal movement in the vehicle; said bulkhead trolleys having a channel contour adapted to engage said rail contour;

means for maintaining said bulkhead in a desired position within the vehicle comprising at least one locking member mounted on the bulkhead for transverse movement within said hollow member and being resiliently biased to engage openings in a fixed portion of the vehicle in a plurality of positions in the vehicle; and actuating means to overcome the resilient bias of said locking member by an operator in the vehicle.

3,908,559

RAIL TRACTION VEHICLE SUSPENSION SYSTEM

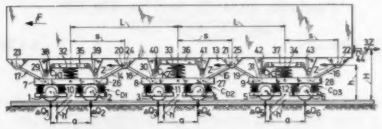
Erich Fromm, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 26, 1972, Ser. No. 301,087

Claims priority, application Switzerland, Oct. 28, 1971, 15698/71

Int. Cl.[2] B61F *1/14, 3/06, 5/06, 5/50*

U.S. Cl. 105—453 **6 Claims**



1. A rail traction vehicle comprising three bogies;
at least two driving axles connected to each respective bogie for applying a tractive effort to a rail;
a plurality of primary spring suspension means each supporting a respective one of said bogies on said driving axles connected thereto;
a vehicle chassis;
a plurality of secondary spring suspension means, each supporting said vehicle chassis on a respective bogie; and means connected to said bogies and said vehicle chassis for compensating the loading of said driving axles;
said primary spring suspension means of the outer bogies of said three bogies having equal spring constants and said secondary spring suspension means of said outer bogies having equal spring constants;
said primary spring suspension means and said secondary spring suspension means of the middle bogie of said bogies having a combined spring constant different from the combined spring constants of said respective primary and secondary suspension means of said outer bogies whereby upon movement of the vehicle in a direction of travel and the application of a tractive effort, said primary and secondary suspenion means of said middle bogie elongate a different amount from said primary and secondary suspension means of the leading bogie to relieve the load of said vehicle on said axles of said middle bogie an amount equal to the load relief on said axles of said leading bogie.

3,908,560

COUNTERBALANCING SYSTEM FOR A DRAFTING TABLE OR THE LIKE

George Irwin Horner, Toronto, Canada, assignor to Onway Construction Company, Limited, Etobicoke, Canada

Filed Sept. 21, 1973, Ser. No. 399,514

Claims priority, application United Kingdom, Sept. 25, 1972, 44288/72

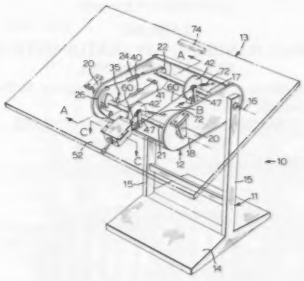
Int. Cl.[2] A47F *5/12*

U.S. Cl. 108—2 **14 Claims**

1. Apparatus comprising a first member, a second member pivotally connected to the first member about a first horizontal axis, a third member pivotally connected to the second member about a second horizontal axis which is spaced from but parallel to the first axis, a first counterbalancing system between said first and second members, and a second counterbalancing system between said second and third members, each counterbalancing system comprising a counterbalancing cam member having an non-circular cam surface, and a spring biased member which is disposed around the cam surface of the counterbalancing cam member and which acts between the two members which are pivotally connected about the respective horizontal axis, with the counterbalancing cam member being fixed relative to one of said two members and with the spring biased member reacting against the other of said two members, wherein a further cam member having a non-circular cam surface is fixed relative to the third member with the spring biased member of the first counterbalancing system disposed around the cam surface of said further cam member, and wherein said counterbalancing cam of said first system and said further cam member are so configured that, within a predetermined range of angular settings of the third member about the second horizontal axis and of the second member about the first horizontal axis, the algebraic sum of: $(W_3 \times d_a) + (F_a \times d_b) + (F_b \times d_c)$ is substantially zero, and the algebraic sum of:

$(W_3 \times d_d) + (W_2 \times d_e) + (F_c \times d_f)$ is substantially zero, in which

W_3 = weight of the third member,



W_2 = weight of the second member,

F_a = force exerted by the spring biased member of the second counterbalancing system on the counterbalancing cam member thereof,

F_b = force exerted by the spring biased member of the first counterbalancing system on said further cam member,

F_c = force exerted by the spring biased member of the first counterbalancing system on the second member,

d_a = perpendicular distance of the second horizontal axis from the line of action of W_3 through the centre of gravity of the third member,

d_b = perpendicular distance of the second horizontal axis from the line of action of F_a,

d_c = perpendicular distance of the second horizontal axis from the line of action of F_b,

d_d = perpendicular distance of the first horizontal axis from the line of action of W_3 through the center of gravity of the third member,

d_e = perpendicular distance of the first horizontal axis from the line of action of W_2 through the centre of gravity of the second member, and

d_f = perpendicular distance of the first horizontal axis from the line of action of F_c.

3,908,561

SINGLE PEDESTAL DRAFTING TABLE

Gary Cowley, 2331 Main, Vancouver, British Columbia, Canada

Filed Feb. 21, 1974, Ser. No. 444,301

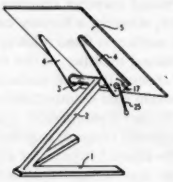
Int. Cl.[2] A47F *5/12*

U.S. Cl. 108—6 **7 Claims**

1. A drafting table comprising
i. an integral one-piece frame including a base, a single inclined post rising therefrom and an elongated horizon-

tal cross tube member mounted centrally on said post in T formation

ii. an inwardly facing cup disposed concentrically over each end of said cross tube member in rotatable bearing-like fit about the end of the tube and



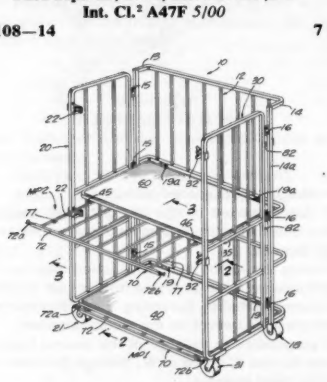
iii. a drawing board carried by the cross tube member of said integral one-piece frame in tiltable relation having a spaced pair of parallel brackets on the rear thereof that lie beyond the ends of said cross tube member and are removably secured against the base of said rotatable cups.

3,908,562

MATERIAL HANDLING APPARATUS WITH SHELF EXTENSION PANEL

Royal C. Wittschen, Burbank, Calif., assignor to Bonus Bilt, Inc., Glendale, Calif.

Filed Sept. 25, 1974, Ser. No. 509,272
Int. Cl.² A47F *5/00*
U.S. Cl. 108—14 **7 Claims**



7. A foldable material handling cart comprising:

a rear wall supported on a pair of wheels;

a pair of side walls pivotally attached to corresponding edges of said rear wall, each of said side walls having a wheel supporting its outer edge, said side walls being pivotable between one position in which they are parallel to each other and perpendicular to said rear wall, and another position in which they are folded back towards the rear wall;

a pair of vertically spaced shelves having their rearward sides pivotally secured to said rear wall, said shelves being adapted to be supported by said side walls in said first position of said side walls and being pivotable upward against said rear wall prior to the folding of said side walls towards said rear wall; and

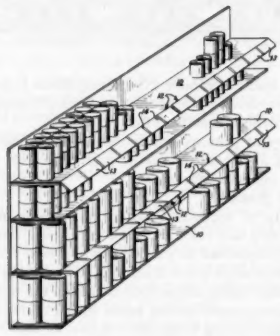
a movable panel associated with one of said shelves, said movable panel being slidably supported on means carried beneath said shelf said means comprising horizontal guideway means carried beneath respective ends of said shelf and extending parallel to the respective side walls, a pair of horizontal guide members supported from respective ones of said side walls at the front edges thereof and being disposed inwardly from and beneath the respective guideway means, the ends of said panel being slidingly supported on said guide members and the rearward edge of said panel having laterally projecting posts slidably supported within said guideway means, said movable panel being normally stored beneath said shelf, and being movable to a partially forward position in which said panel provides a shelf extension, said panel when moved to its fully forward position being also upwardly pivotable relative to the associated shelf and having means associated with the ends of said panel for securing same to respective ones of said side walls to thereby enclose the space above said shelf.

3,908,563

COLOR DISPLAY DEVICE AND SELECTION AID

Edmund Albert Eckart, Jr., Westport, Conn., assignor to Sapolin Paints, Inc., Danbury, Conn.

Filed Dec. 20, 1973, Ser. No. 426,759
Int. Cl.² A47F *5/00*
U.S. Cl. 108—77 **6 Claims**



1. A device for displaying multiple paint colors and the like comprising an elongated panel section having means for containing paint colors on multiple separated areas of the top face thereof throughout its length, a shelving system having a lower horizontal storage shelf for supporting goods and an upper horizontal storage shelf, and means for hingedly attaching the panel section to the frontal edge of said upper horizontal storage shelf, and means attached to the panel section so as to engage the frontal edge of said upper shelf for holding the panel section at an acute angle to the horizontal below said upper shelf while allowing the panel section to be elevated to a horizontal position or substantially above the horizontal, and a latch device on said panel section operable in one position to engage a stationary shelf to which the panel section is hingedly attached and to then hold the panel section in an elevated substantially horizontal position forwardly of said shelf, said latch device movable to an inactive position on said panel section out of engagement with said shelf.

3,908,564

MODULAR DISPLAY STAND

Larry R. Miller, Speedway, and Aldis J. Leikarts, Indianapolis, both of Ind., assignors to Litton Business Systems, Inc., Albert Lea, Minn.

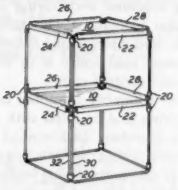
Filed May 23, 1973, Ser. No. 363,272
Int. Cl.² A47B *3/06*
U.S. Cl. 108—111 **4 Claims**

1. A modular support stand having a removable shelf member and a plurality of support bases, said support bases being collapsible when said stand is not in use comprising:

each said support base comprising a plurality of frame sections;

each of said frame sections including a pair of horizontal rod members joined at the ends thereof to the corresponding ends of a pair of vertical rod members to thereby form a substantially rectangular section;

each of said vertical rod members of each frame section being movably joined by hinge means to the vertical rod member of the adjacent frame section to thereby provide a support base having polygonal configuration when said stand is in use;



at least two of said support bases being disposed in vertically stacked relationship to provide an upper and a lower support base;

said removable shelf member including a planar portion having a polygonal configuration corresponding substantially to the configuration of each said support base in its use position and being bordered along each of its side edges by an inverted U-shaped flange portion;

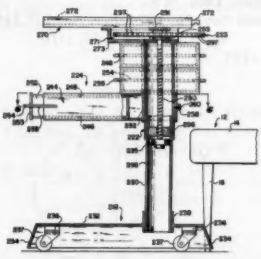
said shelf member flange portion being of sufficient depth to accommodate a pair of said horizontal rod members; each said shelf member flange portion accommodating one upper horizontal rod member of said lower support base and the corresponding lower horizontal rod member of said upper support base.

3,908,565

TRANSPORTABLE OVERBED TABLE

John W. Burnett, 1226 Edmer Ave., Oak Park, Ill. 60302

Filed Dec. 26, 1973, Ser. No. 428,359
Int. Cl.² A47C *3/24*
U.S. Cl. 108—147 **3 Claims**



1. A transportable overbed table comprising a wheeled base, an inner tubular column secured to and projecting vertically upwardly from said base, said base presenting a portion which projects forwardly and radially from the column and is designed for disposition in the vicinity of a bed frame, an outer tubular carriage disposed in coaxial telescopic relationship with respect to and slidable on said column, a table unit having its proximate and mounted on said carriage and projecting radially outwardly therefrom and overlying the projecting portion of the base, a nut disposed within and fixedly secured to said column in the upper region of the latter, a vertically shiftable rotatable elevation screw threadedly received through said nut, disposed within the confines of the tubular carriage and column and effective upon rotation thereof in opposite directions to raise and lower the carraige, and consequently the table unit, a hand wheel fixedly secured to the upper end of the elevation screw above the level of the carriage and below the level of the table unit for rotation of the elevation screw, and counterbalancing means for said carriage and effective to prevent gravitational run-out of the elevation screw incident to the weight of the carriage and table supported thereby, said counterbalancing means comprising an involute coil spring having its inner end secured to said elevation screw and having its outer end slidably confined by means of a vertical guideway provided within the column and along which said outer end of the coil spring travels vertically.

3,908,566

MODULAR SHELVING SYSTEM FOR FOOD SERVICE STORAGE

Ronald B. Frazelle, Fountain Valley, and Neal B. Fuller, Anaheim, both of Calif., assignors to PBR Company, Anaheim, Calif.

Filed June 17, 1974, Ser. No. 480,210
Int. Cl.² A47B *57/00*
U.S. Cl. 108—153 **17 Claims**

1. A modular shelf unit comprising:

a planar rear surface adapted for mounting to a vertically disposed support surface;

upper and lower planar surfaces made integral with the upper and lower edges, respectively, of said rear surface and extending generally perpendicular thereto, the outer edges of said upper and lower surfaces terminating in upwardly and downwardly turned lips, respectively, said lower surface having grooves made integral therewith, said grooves extending in parallel, spaced-apart relationship from said rear surface to said outer edge of said lower surface; and

a pair of planar end walls made integral with the side edges of said upper, lower and rear surfaces, the outer edges of said end walls terminating in sidewardly, outwardly turned lips made integral with said lips of said upper and lower surfaces.

3,908,567

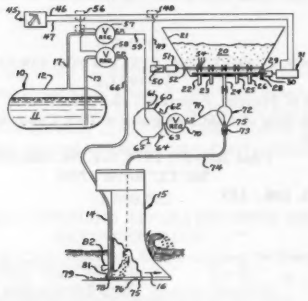
APPARATUS AND METHOD FOR DEPOSITING PARTICULATE MATTER BENEATH THE SURFACE OF SOIL

Leonard M. Brannan, 376 N. 119 Plaza, Omaha, Nebr. 68154

Filed Dec. 7, 1973, Ser. No. 422,876
Int. Cl.² A01C *23/02*
U.S. Cl. 111—7 **10 Claims**

1. Apparatus for depositing material beneath the surface of soil comprising: a source of material pulled by a tractor; a plurality of discharge conduits each connected at an input end to said source to receive said material and including an outlet end for delivering said material; a plurality of applicator

knives pulled by said tractor and each knife including a channel coupled to the outlet end of an associated one of said discharge conduits for receiving material from said source, each knife further defining a discharge opening extending partially up the rear wall of the knife for depositing said material at the bottom of a trough cut by the knife; a source of pressurized ammonia pulled by said tractor; a tube behind each applicator knife and including a discharge orifice for depositing liquid ammonia from said source in said band, said discharge orifice of each knife being located beneath the uppermost extension of an associated discharge opening of a knife whereby said gaseous ammonia released from a knife



will tend to maintain the liquid ammonia in a band unitl it is covered; fluid conduit means including pressure-regulating means for introducing gas from said source under pressure into each discharge conduit at a location adjacent said input end of each discharge conduit to thereby assist the delivery of said material to said knives and to maintain gas flow through substantially the entire length of said discharge conduits and said channels of said knives; and means for controlling the delivery of said gas to said discharge conduits; whereby said conduits and said knives are continuously subject to the flow of pressurized gas and said gas and material is discharged through said discharge openings of said knives.

3,908,568

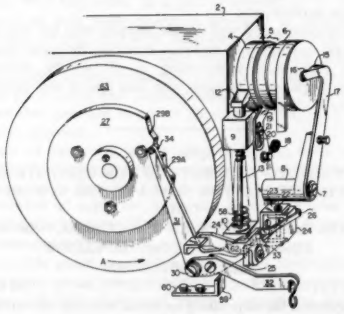
SEWING MACHINE DRIVE CONTROL DEVICE

Ikunori Fujii, Fuchu, Japan, assignor to Tokyo Juki Kogyo Kabushiki Kaisha, Japan

Filed Sept. 19, 1973, Ser. No. 398,782

Int. Cl. D05b *3/00*

U.S. Cl. 112—67 **3 Claims**



1. A control device for a sewing machine having a frame, primary mover means and a main shaft, said control device comprising:

a control cam interlocked with said main shaft for rotation in one direction at a speed lower than that of said main shaft, said control cam having a cam surface including a cylindrical surface portion, a recess portion, and first and second cam portions, each cam portion having a cam surface extending from said recess portion to said cylindrical surface portion with the distance between an axis of the rotation of said control cam and said cam surface being gradually increasing from said recess toward said cylindrical surface portion;

an interlocking member pivotally mounted on said frame of said sewing machine and having a first end carrying a follower roller in contact with said cam surface of said control cam, said interlocking member being reciprocally pivotable while said roller is in contact with said cam surface of said control cam;

a control lever rotatably mounted on said frame of said sewing machine and coupled with a second end of said interlocking member, said control lever being reciprocally pivotable about an axis in response to pivoting movement of said interlocking member, said control lever being shiftable about said axis by said interlocking member among a first position when said follower roller is in said recess portion of said cam surface of said control cam, to a second position when said follower roller is in contact with said cam portion of said control cam, and a third position when said follower roller is in contact with said cylindrical surface portion of said control cam;

clutch means for transmitting and interrupting power from said primary mover means to said main shaft, said clutch means being operatively coupled with and controlled by said control lever in such a manner that when said control lever is in said first position, the power transmission is interrupted, and when said control lever is in said second position, a low-speed transmission of power is effected, and when said control lever is in said third position, a high-speed transmission of power is effected; and

an operation lever means operatively connected to said interlocking member for selectively shifting said control lever from said first position to said second position for starting said sewing machine.

3,908,569

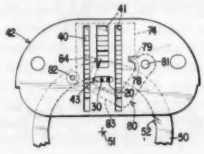
APPARATUS FOR BLIND STITCH SEWING

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, New York, N.Y.

Filed Nov. 26, 1974, Ser. No. 527,315

Int. Cl.[2] **D05B** *1/06, 1/10*

U.S. Cl. 112—197 **9 Claims**



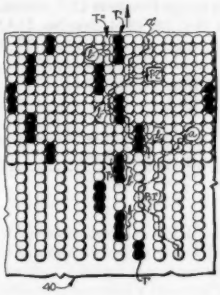
1. A set of fittings for producing a blind stitch hem on a sewing machine having an endwise reciprocatory needle bar, a four motion work feed dog for establishing a line of stitch formation relatively to the path of reciprocation of said needle bar, and a loop taker including a beak movable in a loop seizing motion transversely across the line of stitch formation, said set of fittings comprising a needle assembly adapted to be secured to said needle bar and including a pair of needle blades arranged in parallel relation, that one of said needle blades toward which the loop taker beak approaches during loop seizing motion being formed with a thread accommodating eye pointed extremity, and the other of said needle blades

being formed with an extremity provided with a thread engaging hook, and a throat plate having articulated thereunder a thread deflecting element operatively connected to said work feed dog to engage the thread seized by said loop taker beak from said thread carrying needle to deflect said engaged thread around said hook needle.

3,908,570
PATTERNED TUFTED FABRICS AND METHOD OF MAKING SAME

Sandres Alfred Puckett, Laurinburg, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Filed May 26, 1972, Ser. No. 257,152
Int. Cl.[2] D05C *17/02*
U.S. Cl. 112—410 **9 Claims**

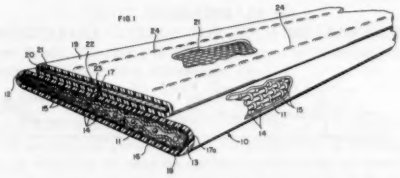


1. A tufted pile fabric comprising a base and pile yarns penetrating the base and forming on one surface of the base longitudinal rows of pile tufts, each of said longitudinal rows of pile tufts comprising successive groups of pile tufts with each group having a series of pile tufts therein, the pile tufts in any given group being formed of the same pile yarn with adjacent groups of pile tufts in each longitudinal row being formed of different pile yarns, alternate rows of said pile tufts being formed of one set of pile yarns and intervening rows of tufts being formed of a different set of pile yarns, and said pile yarns forming said alternate rows crossing said pile yarns forming said intervening rows on the reverse side of said base from said pile tufts.

3,908,571
STRAPPING

Donald M. Motsenbocker, Rt. 2, Box 35, Wylie, Tex. 75098

Filed Nov. 12, 1973, Ser. No. 414,865
Int. Cl. B32b *7/08*
U.S. Cl. 112—441 **4 Claims**



1. A strap for simulating strips of stitched and folded leather and having substantially the equivalent appearance and strength thereof, comprising:

an elongated core of flat woven textile fiber multilayer web centrally positioned within said strap for providing a relatively high strength flexible nucleus therefor;

a protective multilayered cover folded around said core, circumferentially enclosing it, said cover comprising an outer wear layer of relatively abrasion resistant polymeric material uniformly bonded to a relatively thin inner layer of reinforcing fabric, the longitudinal edges of said protective cover facing each other along a longitudinal face of said strap forming a continuous joint extending therealong;

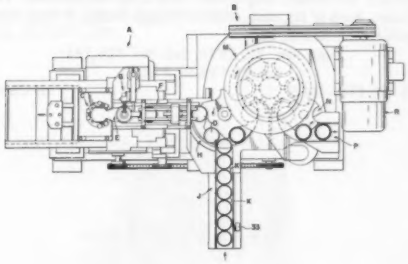
an edge protecting multilayered cover comprising a wear layer of said relatively abrasion resistant polymeric material uniformly bonded to a relatively thin layer of reinforcing fabric, with the longitudinal edges of said cover folded under to face each other along a longitudinal face thereof, said edge protecting cover being longitudinally positioned over said continuous joint of said protective cover with said folded edges of said edge protecting cover adjacent thereto, whereby the facing edges of both multilayered covers are disposed therebetween and adjacent said elongated core;

and rows of stitching uniting said elongated core and said multilayered covers into a relatively high strength strap, said stitching being positioned outwardly of and extending through the layers and edges of said pair of multilayered covers and said elongated core.

3,908,572
APPARATUS AND METHOD FOR ASSEMBLING ENDS TO CAN BODIES

Earl Willard Johnson; John Sherman Ringler, and Bernard K. Hook, all of Hastings, Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed July 22, 1974, Ser. No. 490,413
Int. Cl.[2] B21D *51/26*
U.S. Cl. 113—1 E **33 Claims**



1. Apparatus for assembling and joining can bodies having peripheral end edges with preformed can ends having can body receiving peripheral grooves, comprising:

means to support a supply of can ends;

conveyor means adapted to receive and intermittently convey a can end through a series of stations;

means to deliver a can end from said supply onto said conveyor means with said peripheral groove facing upwardly;

means at one of said stations to deposit joining compound in the peripheral groove of said can end;

means to position a peripheral end edge of a can body in said groove to contact the joining compound therein; and

means to close said peripheral groove about said peripheral end edge of said can body.

3,908,573

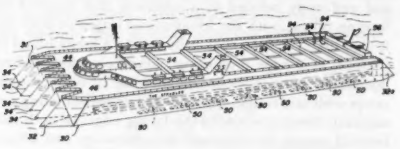
SHIP STRUCTURE

Frank Broes, McLean, Va., assignor to Stradler Ship Company, Jacksonville, Fla.

Continuation-in-part of Ser. No. 249,595, May 2, 1972, Pat. No. 3,786,772. This application Jan. 14, 1974, Ser. No. 431,132

Int. Cl.² B63B *1/10, 35/28*

U.S. Cl. 114—43.5 VC 27 Claims



1. A ship structure comprising a pair of spaced, generally parallel, generally transversely aligned, elongated hull forms, a bow secured between the hull forms and having a front portion transversely spaced from each of the hull forms and partially defining a pair of water-receiving passageways respectively on opposite sides thereof, means providing a pair of channels disposed respectively on opposite sides of the bow adjacent the bottom thereof, the channels extending generally parallel to the hull forms and communicating respectively with the water-receiving passageways on the opposite sides of the front portion of the bow, and a pair of deflecting means disposed respectively on opposite sides of the bow and sloping downwardly and rearwardly respectively to the channels to direct water in the water-receiving passageways downwardly to the channels when the ship structure is moving forwardly, the bow and the hull forms having flat, horizontal bottom surfaces, being pointed, and respectively having straight leading edges which slope upwardly and rearwardly.

3,908,574

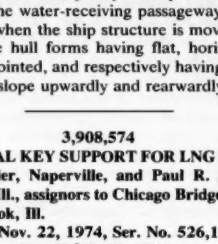
SLIDING RADIAL KEY SUPPORT FOR LNG SHIP TANKS

Clarence D. Miller, Naperville, and Paul R. Johnson, Oak Lawn, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Nov. 22, 1974, Ser. No. 526,131

Int. Cl.² B63B *25/08*

U.S. Cl. 114—74 R 8 Claims



1. In a ship having a cargo tank, with a circular horizontal cross-section, which expands and contracts in service, supported therein, the improved tank support system comprising:

a plurality of spaced-apart support keys mounted on and located around the periphery of the tank in a substantially horizontal arrangement;

each support key having a pair of opposing spaced-apart vertical key contact faces, with each key contact face lying in a vertical plane radial to the vertical axis of the tank;

a plurality of spaced-apart support keyways joined by connecting means to a ship hold, said support keyways being located around the periphery of the tank with a support keyway opposite each support key;

each support keyway having a pair of opposing spaced-apart vertical keyway contact faces positioned at about the same radial angle as the key contact faces and positioned to have a keyway contact face in mating contact with a key contact face;

a plurality of load bearing surfaces on the ship hold around the periphery of the tank; and

a plurality of load applying surfaces on and around the periphery of the tank in slidable pressure contact with the load bearing surfaces;

whereby upon expansion and contraction of the tank with temperature change uniform slidable support contact is maintained between mating key contact and keyway contact faces, and between the load bearing and load applying surfaces.

3,908,575

ANCHOR PARTICULARLY SUITABLE FOR SMALL BOATS

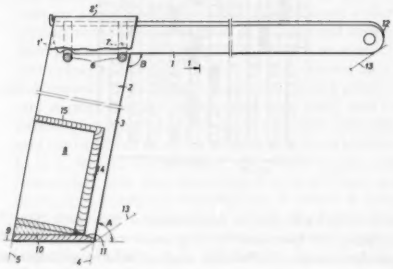
Mario Giolfo, Via Sergio Piombelli 27/3, Genoa, Certosa, Italy

Filed Oct. 15, 1974, Ser. No. 514,914

Claims priority, application Italy, Dec. 27, 1973, 13012/73

Int. Cl.² B63B *21/24*

U.S. Cl. 114—206 R 5 Claims



1. An improved anchor particularly suitable for medium and small boats, comprising a straight stem and a substantially tubular anchoring body with parallel bases, said bases forming with the axis of said tubular body an oblique angle, said stem being fastened inside said tubular body, parallel to a generatrix thereof in such a position that the stem projects through one of said bases and that the axis of said stem intersects said one base of said tubular body at an angle larger than 90°.

3,908,576

FLOATING MOORING ARRANGEMENT

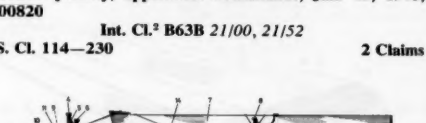
Cornelis Van der Gaag, Delft, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed Jan. 14, 1974, Ser. No. 433,244

Claims priority, application Netherlands, Jan. 19, 1973, 7300820

Int. Cl.² B63B *21/00, 21/52*

U.S. Cl. 114—230 2 Claims



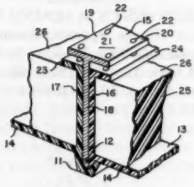
1. Floating mooring arrangement comprising a first annular part held in place by anchors and anchor chains, a second annular part which is rotatable relative to the first part about a vertical axis and which has means thereon for mooring a ship thereto and further comprising a tower placed on the sea bottom and extending upward through said first annular part,

conduits extending from the sea bottom upward via the tower, the upper end of said conduits through a swivel and flexible conduits being connected to pipes on the second annular part, said annular parts having inner diameters such that within the range of movability allowed by the anchor chains to the first annular part, said parts cannot touch the tower, said first and second annular parts riding on the surface of the water and being vertically movable relative to the tower.

3,908,577
LAND AND WATER TRANSPORT

Richard Struyk, 1918 Columbia Pike, Arlington, Va. 22204

Filed Apr. 11, 1974, Ser. No. 460,021
Int. Cl.² B60F *3/00*
U.S. Cl. 115—1 R **8 Claims**



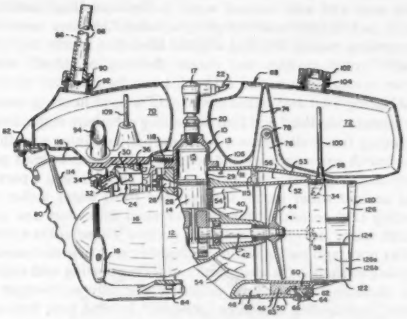
1. A device of the character described to provide a floatation platform for use as a means for floating and transporting a land vehicle to thus convert the same to an amphibious vehicle, said platform comprising a plurality of flotation components shaped to form a sectionalized hull, bow, stern and sides for the said platform, each component including adjacently disposed side walls having a bottom and upper edge, a buoyant material in said hull, bow, stern and sides, cooperating fastener elements extending along the adjacent side walls of each of said components, one of said walls terminating in a shallow area formed integral along the bottom edge of one of the said components and having a wing portion at the upper edge extending over a portion of said buoyant material, the wall of the next adjacent component having a rib at the lower edge thereof and a wing portion at the upper edge thereof extending over a portion of the said buoyant material, said rib nesting within said hollow area when the adjacent components are in assembled relationship, cross beams extending over said assembled components, a leg portion depending from said cross beams, said leg portion extending between the said side walls of said components and into said shallow area and the wall of the next adjacent component having said rib formed thereon, for frictionally retaining said components in assembled relationship, said cross beams having wing portions extending over the wing portions of said walls and means for securing said wing portions on said cross beams to said wing portions on said wall sections.

3,908,578
EXHAUST SYSTEMS FOR AQUATIC CRAFT

Eggert Buelk, Hamburg, Germany, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed June 6, 1973, Ser. No. 367,616
Int. Cl.² A63C *11/10*
U.S. Cl. 115—6.1 **2 Claims**

1. A unitary self powered craft for propelling an individual through water at or near its surface comprising; an internal combustion engine having an exhaust port to conduct the flow of exhaust gas from said engine, propeller means located to the rear of said engine and near the rear of said craft and drive connected to said engine, said propeller being mounted for rotation about an axis substantially parallel to the direction of movement of said craft when being driven by said propeller, means on said craft adapted to be grasped by said individual from the rear of said craft whereby the rear portion of said craft is located between the arms of said individual and said propeller is located generally beneath said individual when so grasped, generally cylindrically shaped guard means mounted on said engine directly to the rear thereof and in surrounding relationship to said propeller to prevent accidental contact between the propeller and said individual, said guard means

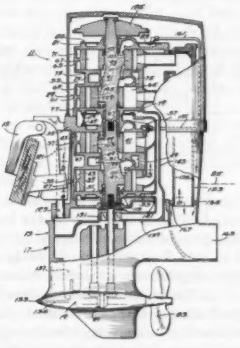


having generally cylindrically shaped concentric inner and outer walls forming an exhaust chamber therebetween which circumscribes said inner wall, means to connect said chamber to said exhaust port and means on said guard to permit discharge of said exhaust from said chamber while preventing entry of water into said chamber, said last mentioned means being located at substantially the lowermost point of said guard.

3,908,579
OUTBOARD MOTOR WITH DUAL COOLING SYSTEM

George E. Miller, Libertyville, and Michael J. Griffith, Waukegan, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 20, 1974, Ser. No. 444,049
Int. Cl.² B63H *5/13*
U.S. Cl. 115—17 **5 Claims**



5. An outboard motor comprising means adapted for attachment to the stern of a boat and a propulsion unit connected to said attachment means for vertical and horizontal swinging movement relative to said attachment means, said propulsion unit including a rotary internal combustion engine including a first housing assembly comprising means defining aligned first and second trochoid shaped rotor cavities and

means defining a first water jacket system adjacent to said first and second rotor cavities and having inlet and outlet ports, said first housing assembly further comprising first and second housing members respectively including first wall means at least partially defining said first and second rotor cavities and second wall means at least partially defining first and second water jackets forming a part of said first water jacket system, said first water jacket including said first water jacket system inlet port and said second water jacket including said first water jacket system outlet port, a second housing assembly comprising means defining aligned third and fourth trochoid shaped rotor cavities and means defining a second water jacket system adjacent to said third and fourth rotor cavities and having inlet and outlet ports, said second housing assembly comprising third and fourth housing members respectively including first wall means at least partially defining said third and fourth rotor cavities and second wall means at least partially defining third and fourth water jackets forming a part of said second water jacket system, said third water jacket including said second water jacket system inlet port and said fourth water jacket including said second water jacket system outlet port, and means securing together said first and second housing assemblies, a lower unit rigidly supporting said engine and including a gear box normally partially submerged in water, a propeller rotatably supported by said gear box and operably connected to said engine, a water pump driven by said engine and having an inlet communicating with the water, and a water conduit communicating between said pump and separately with each of said first and second water jacket system inlet ports.

3,908,580

BRIDGE PARTS, ESPECIALLY FLOATING BODIES OF AN AMPHIBIOUS BRIDGE VEHICLE

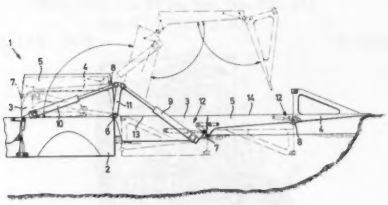
Walter Kinzel, and Klaus Linck, both of Mainz, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Apr. 10, 1974, Ser. No. 459,649

Claims priority, application Germany, Apr. 11, 1973, 2318139

Int. Cl.[2] B63F *3/00*

U.S. Cl. 115—1 B **1 Claim**



1. An amphibious vehicle having a floatable vehicle body, which includes: a plurality of floatable bridge bodies, a plurality of joint means pivotally connecting said bridge bodies to each other and to said floatable vehicle body, a plurality of elbow lever means respectively arranged within the region of at least some of said joint means and additionally interconnecting adjacent floatable bridge bodies, and a plurality of power operable pivoting means respectively supported by said floatable bridge means and operatively connected to said elbow lever means for selectively moving the same into a first position to respectively pull adjacent floatable bridge bodies together and securing the same in pulled-together position or into a second position for separating portions of adjacent floatable bridge bodies to permit folding said floatable bridge bodies about said joints and placing the same in superimposed position upon said floatable vehicle body, each of said elbow lever means including two arms connected to each other by a joint and each pivotally mounted on the respective adjacent floatable bridge body by another joint, one of said floatable bridge bodies being arranged between and linked to two adjacent bridge bodies and being displaceable substantially in parallel, the arms of each of said elbow levers being of different length, the longer one of said arms being journalled in said bridge body, fluid operable cylinder-piston systems respectively operatively connected to said longer ones of said arms for actuating the same, pivotable lever means respectively interconnecting the cylinder-piston systems with the pertaining longer one of the respective pertaining two arms, said pivotal lever means respectively being offset with regard to the pertaining longer one of said arms, the joints of each elbow lever means in effective bridging position of said bridge bodies being located on a common line of action extending in the longitudinal direction of the pertaining floatable bodies.

3,908,581

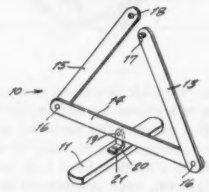
MOTORIST'S WARNING SIGN

Irving Zeizel, c/o George Spector, Room 3615, Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Mar. 12, 1973, Ser. No. 340,021

Int. Cl. E01f *9/01*

U.S. Cl. 116—63 P **2 Claims**



1. A device to warn approaching motorists of a stalled vehicle comprising a support base block and an assembly of parallel elongated arms pivotally secured to each other, said assembly being mounted on said base block, the longitudinal axis of said arms being disposed in spaced parallel planes, each of said arms having transverse widths whereby the transverse width of the base block is greater than the combined transverse width of said arms, the assembly being mounted longitudinally on the base block whereby the longitudinal axis of both base block and assembly are in the same plane, said assembly being movable to a collapsed compact position wherein the longitudinal axis of the arms are parallel and at a minimum distance from the base block providing compactness, said assembly being movable to an expanded position forming a geometric figure wherein the longitudinal axis of the arms are inclined to the longitudinal axis of the base block, wherein two of said arms having spaced ends pivotally secured to the base block with pivot pins having transversely spaced axis at least one of said arms having a longitudinal slot therein slidably connected to said other arm whereby the assembly can be moved from the base to the expanded position, including spring means mounted on said block engaging said arms, further including means on said arms coacting with said spring means to retain said arms in the expanded position.

3,908,582

WARNING UNDERGROUND SHEATHED TAPE

Herschel Lee Evett, Arlington, Tex., assignor to Griffolyn Company, Inc., Houston, Tex.

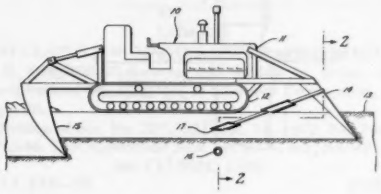
Filed Aug. 23, 1973, Ser. No. 390,721

Int. Cl.[2] G01D *21/00*

U.S. Cl. 116—114 R **17 Claims**

1. A warning tape adapted to be buried beneath the ground and in such a position near an installation to be protected from damage by a digging or probing element being moved through the ground that it will be engaged and pulled by the element before engagement of said element with said installation, said

tape comprising an elongate sheath made from a plastic material which is non-decomposable in the ground in which it is to be buried and tearable when engaged and pulled by the element, and a ribbon made from a reinforced plastic material and extending longitudinally within the sheath and being longitudinally extendible upon release from the sheath so as to resist tearing by the element when engaged and pulled



thereby, the exterior surface of said ribbon and the interior surface of the sheath each provided with a low coefficient of friction, so that when said sheath is torn and said ribbon is pulled by said element, portions of said ribbon adjacent the tear are readily slidable from within the sheath and longitudinally extendible into a length which provides a readily observible warning of the nearness of said installation.

3,908,583

CONVEYING APPARATUS WITH CONTROLLED SPRAY MEANS FOR COATING PRINTED PRODUCTS

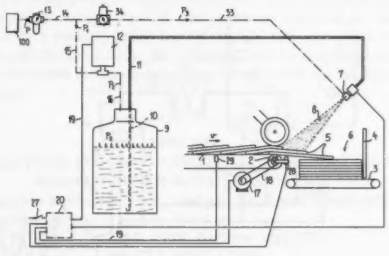
Jürg Eberle, Hinwil, Switzerland, assignor to Fehr & Reist AG, Hinwil, Switzerland

Filed May 15, 1973, Ser. No. 360,471

Claims priority, application Switzerland, May 23, 1972, 7603/72

Int. Cl.[2] B05C *5/00, 11/00*

U.S. Cl. 118—2 **4 Claims**



1. In an apparatus for automatically forming packages of printed products from a stream of said products being conveyed in a fish-scale sequence, a bonding agent conveying apparatus comprising means for conveying said products in a fish-scale sequence, means for generating a regulating signal having a value which varies in accordance with the speed at which said products are being conveyed, a source of compressed air, a pressurized container for a liquid bonding agent, converter means controlled by said regulating signal and connecting the compressed air source with said pressurized container for regulating the pressure in said pressurized container in accordance with the speed at which said products are being conveyed, means proximate said conveyor for forming a regulatable spray stream of said liquid bonding agent onto said printed products, means for conveying the pressurized liquid bonding agent in said container to said liquid stream forming means, the rate of flow of said bonding agent into said liquid spray stream forming means being proportional to the pressure in said container and being substantially proportional to the speed at which said products are being conveyed, and means for forming a package of said printed products, wherein said bonding agent stabilizes said package of printed products.

3,908,584

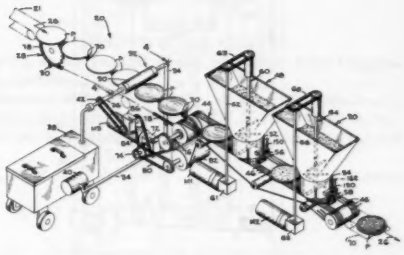
PIZZA TOPPING MACHINE

Robert G. Raque, Louisville, Ky., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 6, 1974, Ser. No. 440,107

Int. Cl.[2] B05C *5/00, 13/00*

U.S. Cl. 118—2 **7 Claims**



1. A pizza topping machine comprising:

a. an input conveyor for continuously conveying a series of circular pizza dough shells along a linear path;

b. a topping dispensing valve extending transversely above said path;

c. said valve including a fixed cylindrical tube having a longitudinal dispensing slot along its bottom sector;

d. a hollow cylindrical rotor within said tube having a pattern of circumferentially disposed, axially spaced curvilinear slots arranged to communicate the interior of said rotor with said dispensing slot, said slots having a developed pattern that lies within the confines of a circle;

e. axial inlet and outlet conduits connected to said rotor;

f. a circulation pump connected to said inlet conduit for supplying the flowable topping under pressure to the interior of said rotor;

g. means for driving said rotor in timed relation with said input conveyor with the lower section of said rotor moving counter to the direction of movement of said pizza dough shells;

h. a heated reservoir for the topping connected to said pump and to said outlet conduit to maintain the circulating topping material within a predictable temperature range, and hence, viscosity;

i. a transport conveyor for receiving the pizza dough shells covered with the flowable topping;

j. means for continuously driving said transport conveyor at a velocity exceeding the velocity of said inlet conveyor to increase the spacing between said shells;

k. a hopper mounted over said conveyor;

l. a circular perforate bottom wall on said hopper;

m. an agitator within said hopper;

n. means for sensing a shell approaching vertical alignment with said hopper;

o. a stop actuated by said sensing means to interrupt said shell in vertical alignment with said bottom wall; and

p. means actuated by said sensor for driving said agitator for a predetermined time.

3,908,585

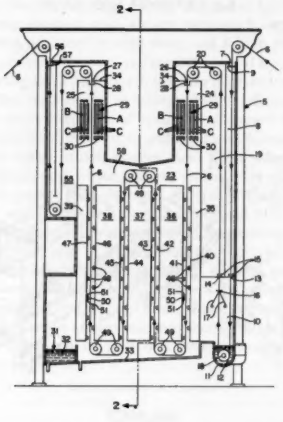
APPARATUS USING SUPER-HEATED VAPOR FOR DRYING SOLVENT-TREATED TIRE CORD FABRIC

Theodore F. Griffin, Barberton; Edward E. Hunter, Akron, and Grover W. Rye, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 25, 1974, Ser. No. 463,956

Int. Cl.² B05B *17/00*

U.S. Cl. 118—48 **19 Claims**



1. An apparatus for treating tire cord fabric, comprising in combination:

a. means for coating tire cord fabric with a liquid mixture of an agent for promoting the bond between warp tire cords of the fabric and rubber material used in the production of tires, and a solvent which is vaporizable, chemically compatible with the agent, and a carrier of the agent;

b. a chamber sealed from the means for coating the fabric and the ambient atmosphere;

c. means for guiding the fabric successively through the means for coating the fabric and the chamber;

d. means for filling the chamber with vapor of a solvent which is similar to the solvent of the mixture; and

e. means for contacting the fabric with superheated vapor of a solvent which is similar to the solvent of the mixture, to evaporate solvent carrier on the fabric, said means including:

I. means for continually removing solvent as a vapor from the chamber, and

II. means for superheating the removed solvent vapor for recirculation to the chamber and contact with the fabric.

3,908,586

APPARATUS FOR DOPING SEMICONDUCTOR RODS DURING FLOATING ZONE MELT PROCESSING THEREOF

Ludwig Sporrer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

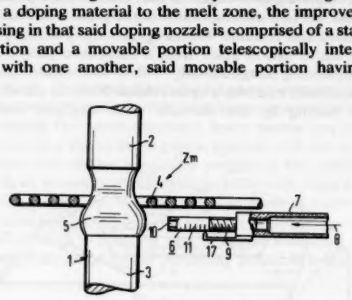
Filed Mar. 4, 1974, Ser. No. 447,745

Claims priority, application Germany, May 28, 1973, 2327085

Int. Cl.² C23C *13/12*

U.S. Cl. 118—49.1 **7 Claims**

1. In an apparatus for doping a semiconductor rod during a floating zone melt processing thereof which includes means attached to the ends of said rod for vertically supporting said rod, an induction heating coil arranged to annularly encompass said rod and generate a melt zone on said rod and a doping nozzle arranged in the vicinity of said heating coil for guiding a doping material to the melt zone, the improvement comprising in that said doping nozzle is comprised of a stationary portion and a movable portion telescopically interconnected with one another, said movable portion having an



exhaust opening facing said rod and having a visible vernier scale on a surface thereof, said scale being calibrated in accordance with rod diameter units and comprising indicator means for the spacing of nozzle discharge into said melt zone upon telescopic adjustment of said nozzle portions.

3,908,587

APPARATUS FOR IMPREGNATING CORRUGATED CARDBOARD

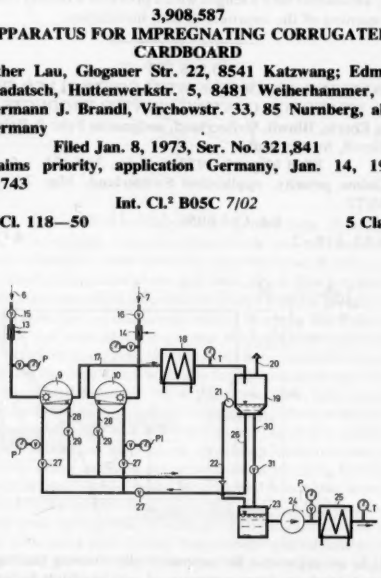
Gunther Lau, Glogauer Str. 22, 8541 Katzwang; Edmund Bradatsch, Huttenwerkstr. 5, 8481 Weiherhammer, and Hermann J. Brandl, Virchowstr. 33, 85 Nurnberg, all of Germany

Filed Jan. 8, 1973, Ser. No. 321,841

Claims priority, application Germany, Jan. 14, 1972, 2201743

Int. Cl.² B05C *7/02*

U.S. Cl. 118—50 **5 Claims**



1. Apparatus for impregnating horizontally arranged and advancing corrugated board with a liquid impregnating agent having an air carrier means to form an air-impregnating agent mixture with said mixture being inserted into said board by means of an application device positioned along one longitudinal edge of the board, said apparatus comprising:

a. suction chamber means arranged along the longitudinal edge of said board opposite from said application device,

b. a plurality of liquid ring pumps each having a vacuum input,

1. the respective vacuum inputs of each liquid ring pump being in parallel flow relationship with the other vacuum inputs and each being coupled to said suction chamber means for drawing said mixture of air and liquid impregnating agent into said liquid ring pumps, said liquid ring pumps each forming a liquid ring therein with said liquid impregnating agent from said mixture,

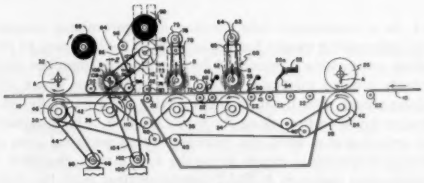
2. common separator means having means communicating with the respective pressure output sides of said liquid ring pumps, and
3. means coupling said separator means to each of said pumps for providing said liquid impregnating agent thereto for supplementing the impregnating agent from said mixture and for maintaining said liquid ring with said liquid impregnating agent therefrom.

3,908,588

APPARATUS FOR MAKING DECORATIVE PANELS

Lyn R. Daunheimer, Batavia, and William M. Irvine, Lombard, both of Ill., assignors to Masonite Corporation, Chicago, Ill.

Division of Ser. No. 287,682, Sept. 11, 1972, Pat. No. 3,847,646. This application June 10, 1974, Ser. No. 477,917
Int. Cl.² B05C *11/02*
U.S. Cl. 118—58 **5 Claims**



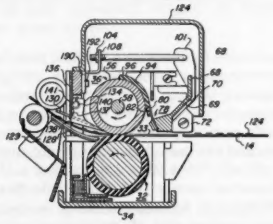
1. Apparatus for decorating the surface of building panels comprising means for moving said panels along a substantially horizontal path in one direction at a controllable speed, panel surface treatment-means including sequence in said one direction along said path, means for directing liquid colorant material onto said surface, means for spreading said colorant material over said surface, means for partially drying said colorant material and means for wiping said colorant material parallel of said one direction including means for applying open mesh woven fabric biased against said colorant material on said surface by a rotating brush having bristles moving across said panels parallel to said one direction and randomly penetrating said open mesh for random wiping contact with said colorant material.

3,908,589

STRUCTURE FOR APPLYING RELEASE AGENT TO A HEATED FUSER ROLL STRUCTURE

Ari Bar-on, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 24, 1974, Ser. No. 482,729
Int. Cl.² B05C *11/04*
U.S. Cl. 118—60 **14 Claims**



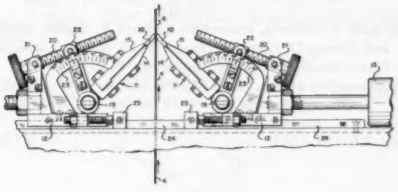
1. Contact fuser structure for fixing toner images to support sheets comprising:
a heated fuser roll structure;
a resilient backup roll structure forming a nip with said heated fuser roll structure through which said support sheets move with said toner images facing said fuser roll structure;
means for applying release material to the surface of said fuser roll structure, said release material applying means comprising:
a sump including a doctoring blade structure forming one wall thereof;
means mounting said sump for pivotal movement relative to said fuser roll structure, said doctoring blade engaging said fuser roll structure substantially coextensive with the longitudinal axis thereof and the fuser roll structure being positioned to rotate in contact with the release material contained in the sump; and
means for adjusting the angular position of said sump to thereby vary the force exerted by said doctoring blade on said fuser roll structure.

3,908,590

OPPOSED BLADE COATER

Richard J. Quint, Dixfield, Maine, assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 82,475, Oct. 20, 1970, abandoned, which is a division of Ser. No. 703,924, Feb. 8, 1968, Pat. No. 3,575,134. This application Mar. 16, 1973, Ser. No. 341,928
Int. Cl.² B05C *11/04*
U.S. Cl. 118—122 **15 Claims**



1. An improved metering blade for use in a web coating apparatus, said improved blade being:
a. relatively thick and constructed of plastic material having a hardness value of between about 90 Shore A and 70 Shore D; and having
b. a flat beveled rectangular working surface at a foreward portion of the blade for engagement against the coated web,
c. said blade having a uniform cross-sectional shape for a distance of at least ½ to 1½ inches from said working surface;
d. said blade being flexible and free from any reinforcement for at least ½ to 1½ inches from said working surface, which distance is greater than the thickness of the blade for permitting flexing thereof along an axis parallel to the plane of said working surface; and
e. means for clamping said blade at its rearward portion at least ½ to 1½ inches away from said working surface.

3,908,591

APPARATUS FOR TREATING SHEET MATERIAL

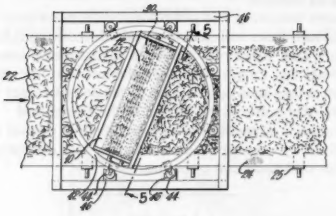
Edward C. Hall, Abbeville, S.C., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 29, 1974, Ser. No. 465,216
Int. Cl. B06b *7/14*
U.S. Cl. 118—308 **14 Claims**

1. Apparatus for applying flowable material to sheet material comprising:
a. means for advancing sheet material along a given path extending through a treatment zone;
b. applicator means above the path for directing a stream of the flowable material downwardly to the treatment zone for application to the sheet material during its advance-

ment, the stream having a width that is greater than its thickness; and

c. support means movably mounting the applicator means so that the applicator means can be moved about an axis



to change the disposition of the width dimension of the stream with respect to the path of the sheet material to effect changes in the area treated by the flowable material in the treatment zone without changing the width of the stream.

3,908,592

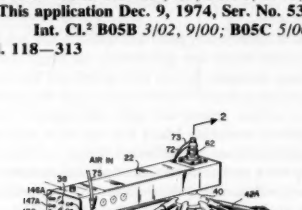
APPARATUS FOR SPRAYING MATERIAL WITH TWO FLUIDS

Richard S. Ordway, Haverhill; Richard E. Quinn, Hamilton, and George O. Comeau, Haverhill, all of Mass., assignors to Circle Machine Co., Inc., Seabrook, N.H.

Continuation of Ser. No. 422,209, Dec. 6, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,677

Int. Cl.² B05B *3/02, 9/00;* **B05C** *5/00*

U.S. Cl. 118—313 **17 Claims**



1. Apparatus for spraying two different fluids on material as it is carried at a predetermined rate by a conveyor, said apparatus comprising above said conveyor, two series of spray heads, means supporting said spray heads above said conveyor and operable to effect their movement across said conveyor first in one direction and then the other the spray heads of one series alternating with those of the other series, each spray head having a spray port and a valve normally closing that port, means to deliver one fluid to the heads of one series and to discharge that fluid as a spray when the valves of those heads are opened, means to deliver the other fluid to the heads of the other series to discharge that fluid as a spray when the valves of those heads are open, means operable to open the valve of each head when it is in at least one predetermined position relative to the conveyor in each direction and while it travels a predetermined distance across the conveyor from that position and including controls to enable the fluids to be delivered to the spray heads of either or both series in either direction or in but one of said directions.

3,908,593

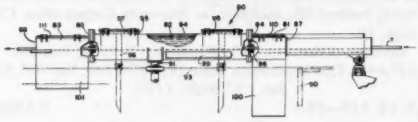
CONTINUOUS GALVANIZING MANIFOLD FOR TUBE AND THE LIKE

Joseph R. Rossi, Cortland; Frederick J. Griffiths, Warren, both of Ohio; James L. Griffin, Jackson Center, Pa., and Gormen C. Palleson, Naperville, Ill., assignors to Maneely-Illinois, Inc., Chicago, Ill.

Division of Ser. No. 248,739, April 28, 1972, Pat. No. 3,845,540. This application June 21, 1974, Ser. No. 481,516

Int. Cl.² B05C *3/02*

U.S. Cl. 118—620 **11 Claims**



1. In a continuous tube forming and galvanizing process line, galvanizing means for application of molten zinc to the tubing comprising a manifold having a main chamber with linearly aligned inlet and outlet orifices through which the tubing passes, said main chamber having a substantially continuous cross section along the major portion of its longitudinal extent and at least one increased cross sectional area of limited longitudinal extent along the top of such chamber, a molten zinc reservoir in fluid communication with the main chamber, and means maintaining continuous molten zinc flow between said reservoir and main chamber to maintain said major portion of said main chamber completely filled with zinc and to expose a surface of said zinc in said main chamber at said increased cross sectional area.

3,908,594

MARKING APPARATUS

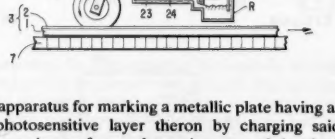
Seiji Matsumoto; Satoru Honjo; Kazuhiro Kawaziri; Sigeru Tezuka, and Etuo Shiozawa, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 30, 1973, Ser. No. 346,292

Claims priority, application Japan, Apr. 3, 1972, 47-33371

Int. Cl.² G03G *13/10*

U.S. Cl. 118—637 **12 Claims**

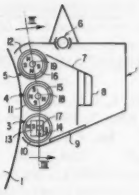


1. In apparatus for marking a metallic plate having a surface electrophotosensitive layer theron by charging said layer, image exposing to form a latent image, and developing said latent image, the improvement of a conveyor belt for feeding said metallic plate disposed on one side thereof, a developing roller disposed on the other side of said metallic plate and directly opposite to at least a portion of said conveyor belt having a porous, sponge like, non-conductive surface layer, said roller being so mounted as not to contact said conveyor belt but to contact said electrophotosensitive layer of the metallic plate with at least the under side of the sponge like surface layer, said sponge like surface containing a liquid developer for effecting said developing as it is squeezed against said electrophotosensitive layer and suction means for removing excessive developer from said metallic plate after a time lag necessary to complete the developing operation.

3,908,595
MAGNETIC BRUSH DEVELOPMENT APPARATUS UTILIZING MAGNETIC MEANS

Ryuzo Okada, Yamato, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1974, Ser. No. 436,713
Claims priority, application Japan, Apr. 5, 1973, 48-38232
Int. Cl.[2] G03G *15/08*
U.S. Cl. 118—637 2 Claims



1. Magnetic brush developing apparatus for developing a latent image on a moving insulating layer with magnetic developer, said apparatus comprising

a rectangular magnet having a longitudinal axis extending substantially parallel to said moving, latent image bearing layer and substantially transverse to the direction of movement thereof, said rectangular magnet having only one plane of polarization which is directed substantially transverse both to said longitudinal axis and said moving, latent image bearing layer to produce a first magnetic field at said layer;

means for moving said magnetic developer through said first magnetic field to initiate development of said latent image;

at least one cylindrical magnet having a longitudinal axis extending substantially parallel to said moving, latent image bearing layer and substantially transverse to the direction of movement thereof, said cylindrical magnet being subsequent to said rectangular magnet along the direction of movement of said image bearing layer and being polarized at a plurality of predetermined angles about said longitudinal axis where, at each angle, said cylindrical magnet is polarized in a direction substantially transverse to said longitudinal axis to thereby produce a plurality of magnetic fields at said layer;

means for transferring said magnetic developer from said first magnetic field produced by said rectangular magnet to said plurality of magnetic fields produced by said cylindrical magnet to continue and complete the development of said latent image;

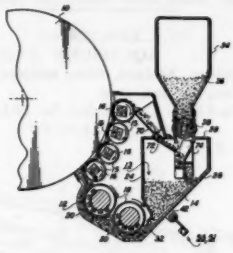
said cylindrical magnet compensating the tendency of said rectangular magnet to underdevelop the latent image portions adjacent the end portions of the rectangular magnet and said rectangular magnet compensating the tendency of said cylindrical magnet to nonuniformly develop the latent image.

3,908,596
SEGMENTED GATE DEVELOPER FLOW CONTROLLER

Richard E. Smith, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1974, Ser. No. 464,863
Int. Cl.[2] G03G *15/06*
U.S. Cl. 118—637 4 Claims

1. In a development system: A surface capable of having a developable image thereon; a developer sump; said sump having ferromagnetic developer therein; magnetic means for presenting said developer to said surface; a developer outlet at the lowermost portion of said sump; said developer flowing through said outlet to said means for presenting said developer to said surface; magnetic gate means comprising at least three gates, each having a permanent magnet; means for selectively moving the two end gates as a unit and the center gate independently of said end gates into a closed position adjacent said outlet to magnetically block the flow of developer through a portion of said outlet corresponding to the gate thereadjacent

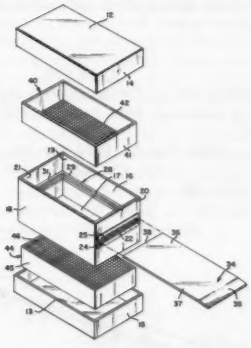


and for selectively moving the two end gates as a unit and the center gate independently of said end gates away from said outlet to an open position to allow flow of developer through said portion of said outlet corresponding to a respective said gate.

3,908,597
SELF STRAINING ANIMAL LITTER BOX

Chester E. Taylor, 19757 Victory Blvd., Woodland Hills, Calif. 91364

Filed July 8, 1974, Ser. No. 486,527
Int. Cl. A01h *29/00*
U.S. Cl. 119—1 11 Claims



1. A litter box comprising:

a. a generally upright receptacle formed with open top and bottom ends and a side wall portion defining a slot;

b. a pair of covers on the receptacle ends;

c. holding means secured to an interior wall portion of the receptacle and arranged between the receptacle ends;

d. a partition removably coupled to the holding means and arranged for passage through the slot, the partition being aligned generally horizontal when the receptacle is in an upright position;

e. a first screen disposed in a chamber between a cover and the partition, the first screen being removable when the corresponding cover is withdrawn from the receptacle; and,

f. a second screen disposed in a chamber between the other cover and the partition, the second screen being removable when the corresponding cover is withdrawn from the receptacle,

wherein, the partition normally operates to block absorbent material from falling from a relatively upper chamber into

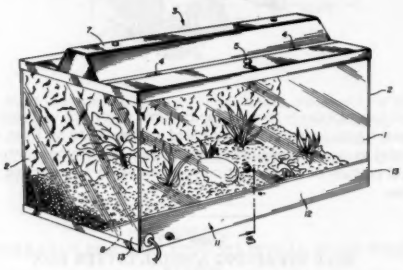
a relatively lower chamber, and, when the partition is pulled externally through the slot then the absorbent material is allowed to fall into the lower chamber with litter waste being retained for disposal on the screen in the upper chamber.

3,908,598

AQUARIUMS

Charles H. Jewson, Ashland, Ohio, assignor to Ashco Ohio Products, Inc., Ashland, Ohio

Filed Sept. 3, 1974, Ser. No. 502,693
Int. Cl.² A01K *63/00*
U.S. Cl. 119—5 **6 Claims**



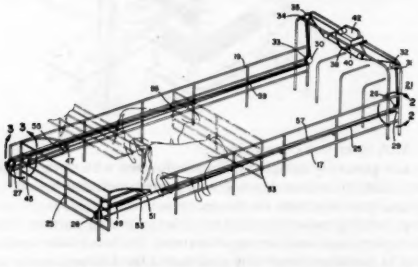
1. An aquarium for aquatic animal and/or plant life at least the front wall of which is transparent, at least the front of the bottom is transparent and slants upwardly at an angle of 10° to 40° to the horizontal, a light is located under this slanting portion of the bottom, and the wall in front of the light is opaque.

3,908,599

AUTOMATED GATHERING PEN FOR LIVESTOCK

Andrew J. Flocchini, 7050 Lakeville Hwy., Petaluma, Calif. 94952

Filed Mar. 13, 1974, Ser. No. 450,635
Int. Cl.² A01K *29/00*
U.S. Cl. 119—20 **10 Claims**



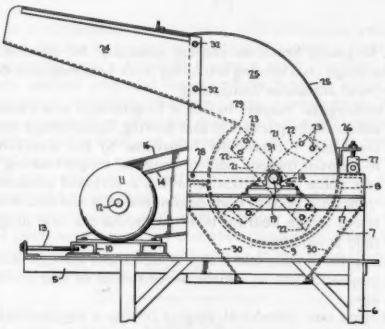
1. In an animal gathering pen of the type having one of its ends terminating in an animal receiving station, another of its ends terminating in an animal processing station, a pair of parallel, elongate sides extending between said ends, a gate moveable between both said sides for sweeping animals within the pen from said receiving station to said animal processing station, means coupling said gate to said sides for moveable support of said gate, and running rigging to effect the sweeping movement of said gate, the improved driving mechanism, comprising a motor, means for driving said running rigging to move said gate, a transmission between said driving means and said motor for transmitting power to said driving means to drive said running rigging to move said gate, means for mechanically sensing power transmitted by said transmission operably connected to said transmission, said power sensing means sensing power transmitted by said transmission exceeding that normally required to drive said gate, and means for interrupting operation of said motor for a preselected period of time, including a timer having an adjustable period operatively connected to said power sensing means to thereby stop sweeping movement of said gate for said preselected period of time when said gate strikes an obstacle during said sweep of said pen.

3,908,600

METHOD FOR MAINTAINING HEALTH OF CONFINED MINK

Doel Halverson, Rt. 1, P.O. Box 64, Dodgeville, Wis. 53533

Filed May 3, 1974, Ser. No. 466,900
Int. Cl.² A01K *7/00*
U.S. Cl. 119—51 R **2 Claims**



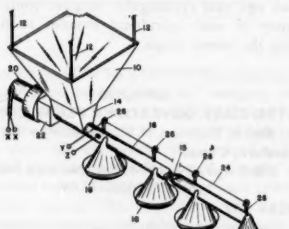
1. A process for maintaining a normal hydration level in confined mink during subfreezing temperatures comprising preparing an ice mix having approximately 80% ice granules with no dimension exceeding one-fourth inch and 20% fines and placing said mix in the mink feeders whereby no further watering is required for approximately one week thereby saving considerable labor.

3,908,601

CONTROL SYSTEM FOR ANIMAL FEEDER

Frederick J. Geary, Holland, Mich., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Aug. 23, 1974, Ser. No. 500,022
Int. Cl.² A01K *5/02*
U.S. Cl. 119—52 AF **11 Claims**



1. In a feed supply system including a hopper and means for transferring feed from the hopper to a remote feeding station which includes a feed level sensor for selectively actuating a drive motor associated with said transfer means, said feed

supply system further including a shock wire mounted thereto, a control circuit for actuating said drive motor and said shock wire comprising:

a relatively high voltage power supply;

means for coupling said high voltage power supply to the shock wire and to the feed level sensor;

supply means for supplying operating current to the drive motor, said supply means including a controllable switch; and

current sensing means coupled to said high voltage power supply and to said controllable switch and responsive to the actuation of said feed sensor for actuating said controllable switch to apply operating current to said drive motor when said feed sensor detects a feed supply below a predetermined level.

3,908,602

STEAM OR HOT WATER GENERATOR USING THE CATALYTIC COMBUSTION OF HYDROCARBONS

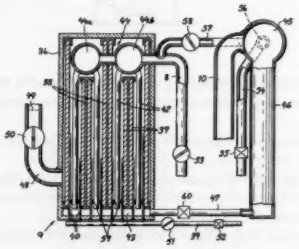
Andre Brulfert, 6 rue des Peintres Parocoel, and Andre-Gabriel Hoss, 23 blvd. Saint-Ruf, both of Avignon, France

Filed Oct. 1, 1973, Ser. No. 402,576

Claims priority, application France, Oct. 4, 1972, 72.35754; Mar. 15, 1973, 73.09377; Mar. 16, 1973, 73.09632

Int. Cl.² F22B *1/00;* **A21D** *4/00*

U.S. Cl. 122—4 D **6 Claims**



1. A steam or hot water generator using the catalytic combustion of hydrocarbons as the sole heating-energy source, comprising a heat-insulated casing forming a housing; a plurality of vertically arranged elongated catalyst elements spaced apart in said housing and capable of producing, when brought into contact with a hydrocarbon in the presence of air and by the catalytic oxidation of the hydrocarbon, an exothermic reaction at a maximum temperature of the order of 400°C, the catalyst elements comprising a substance selected from the group which consists of platinum sponge, cobalt sponge and ferronickel sponge; means for feeding said hydrocarbon and air into contact with said catalyst element; means including banks of tubes in said housing between said elements heated by said reaction for passing watter through said housing and to a heat-consuming load, said water being heated in said tubes, said tubes being laterally joined together to form gap-free wall-like screens around each element; respective diffusers at each of said elements for admitting the hydrocarbon as a fuel thereto; and a main piping system for delivering the hydrocarbon to the diffusers and which serves as many banks of diffusers as there are catalyst elements.

3,908,603

BOILER AND ELEMENTS THEREFOR

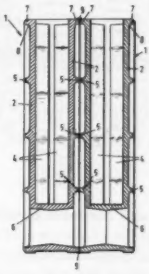
Theodoor Gerardus Maria Schiffelers, Schaesberg, Netherlands, assignor to Beondu A.G., Vaduz, Liechtenstein

Filed June 20, 1974, Ser. No. 481,386

Claims priority, application Netherlands, June 21, 1973, 7308627

Int. Cl.² F22B *23/00*

U.S. Cl. 122—209 R **8 Claims**



1. A boiler element which when connected to similar boiler elements provides a plurality of alternating fire ducts and water ducts separated by a single wall, characterized by said boiler element being cast in one piece in the form of a hollow flat box which, placed in upright position, has an open top and an open bottom; a narrow front wall, a narrow rear wall and broad sidewalls defining a fire duct between them; heat absorbing members extending from said sidewalls into said fire duct; and said sidewalls being of such configuration on the side away from said fire ducts that in two joined elements the opposing sidewalls define a water duct between them which in addition to said sidewalls is peripherally bounded by a narrow, non-deformable peripheral wall having an unbendable connection with the respective adjacent sidewalls.

3,908,604

METHOD OF AND APPARATUS FOR THE HEATING OF A HEAT-TRANSFER MEDIUM

Peter Vöcklinghaus, Essen, Germany, assignor to Mineralol- und Filtertechnik GmbH, Essen, Germany

Filed June 20, 1974, Ser. No. 481,478

Claims priority, application Germany, June 20, 1973, 2331363

Int. Cl.² F22B *27/08*

U.S. Cl. 122—250 R **13 Claims**

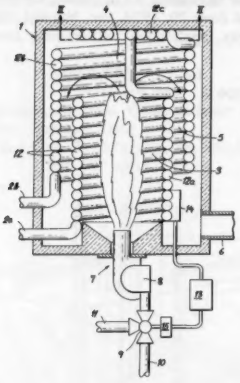
1. A method of centrally heating a heat-transfer fluid comprising the steps of:

circulating said fluid through a heat exchanger;

generating a hot combustion gas contacting said heat exchanger by combustion of at least one fuel composition generating large quantities of gaseous corrosive components upon combustion; and

controlling said combustion by selectively burning a fuel

and said composition so that said combustion gas contacts said heat exchanger only at a temperature above



the dewpoint of said corrosive components in the combustion gas.

3,908,605

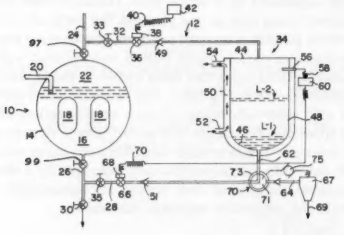
AUTOMATIC BOILER BLOWDOWN APPARATUS AND METHOD

Charles M. Andersen, 5318 W. 95th St., Oak Lawn, Ill. 60453

Filed Nov. 1, 1974, Ser. No. 519,911

Int. Cl.[2] F22B *37/54;* **F22D** *1/00*

U.S. Cl. 122—382 **13 Claims**



1. An apparatus for automatically blowing down a steam boiler, said apparatus comprising, in combination, means for receiving and cooling a charge of high temperature water and sediment blown down from a steam boiler, means for draining said water and sediment from said receiving and cooling means, means providing a blowdown path for water and sediment between a lower portion of said steam boiler and the interior of said receiving and cooling means, normally closed, openable blowdown valve means for controlling the flow of water and sediment in said blowdown path, means for controlling drain flow, and control means for periodically opening said blowdown valve means to permit passage of water and sediment through said blowdown path for short time periods at selected intervals, and for opening said draining means for short time periods at selected intervals, said means for opening said draining means being operable only if said water and sediment have cooled substantially from said high temperature.

13. A method of blowing down a boiler, said method comprising at least partially filling with steam the interior of a holding tank having a first path of communication between said interior and a boiler steam source, and a second path of communication between said boiler interior and said tank interior, permitting said interior to become evacuated by condensation of said steam therein, blowing down said boiler by rapidly transferring water and sediment from said boiler through said second path to said interior of said holding tank, permitting said water and sediment to cool within said holding tank, expelling said water and sediment from said holding tank by applying positive steam pressure to said tank interior through said first path until all of said water and sediment are expelled, and again pressurizing said holding tank so as to fill said tank at least partially with steam, whereby said blowdown cycle may be repeated.

3,908,606

INTERNAL COMBUSTION ENGINE

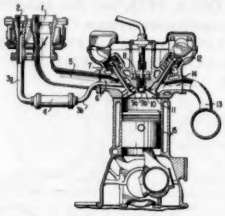
Eiji Toyoda, Toyota; Masaaki Noguchi, Nagoya; Yukiyasu Tanaka; Bunda, Tsuchio, both of Okazaki, and Masaharu Sumiyoshi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jan. 4, 1974, Ser. No. 430,650

Claims priority, application Japan, Feb. 15, 1973, 48-18608

Int. Cl.[2] F02B *43/08*

U.S. Cl. 123—3 **42 Claims**



1. A method for reducing emission of harmful elements in the exhaust of an internal combustion engine, comprising the steps of:

introducing a first quantity of fuel and a first quantity of air into a reformer:

reforming said first quantity of fuel into a first mixture containing decomposition and oxidation products of said first quantity of fuel;

feeding said first mixture to a combustion chamber of said engine;

feeding a second quantity of fuel and a second quantity of air to said combustion chamber, wherein said second quantity of fuel and said second quantity of air have not passed through said reformer; and

burning said first mixture and said second quantity of fuel in said combustion chamber.

3,908,607

APPARATUS FOR ELIMINATING DRAINS IN A ROTARY COMBUSTION ENGINE

Russell J. Van Rens, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

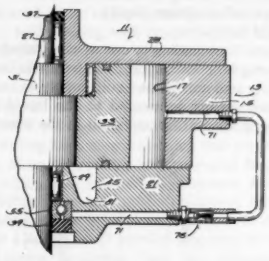
Filed Feb. 20, 1974, Ser. No. 444,053

Int. Cl.[2] F02B *53/00*

U.S. Cl. 123—8.01 **7 Claims**

1. A rotary internal combustion engine comprising a housing assembly defining a rotor cavity including a peripheral wall, a fuel inlet communicating with said cavity, means defining a drains collecting area, a rotor located for rotation in said cavity and including a plurality of apex portions in engagement with said peripheral wall so as to create in said cavity and in response to rotor rotation a substantially sealed moving chamber which, during one portion of the rotor rotational cycle, expands in volume and which, after an initial interval of expansion, communicates with said fuel inlet to permit inflow of fuel into said moving chamber for subsequent compression and ignition, and means operable in response to the initial

interval of expansion of volume in said chamber during said first portion of the rotor rotational cycle and prior to commu-



nication with said fuel inlet for pumping drains from said drains collecting area to said moving chamber.

3,908,608

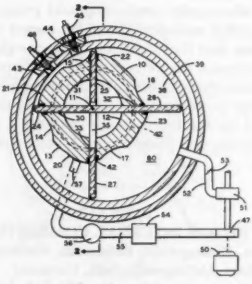
ROTARY PISTON ENGINE HAVING A TURBO-SUPERCHARGER

Hans G. Fox, 12 Diane Ct., New Providence, N.J. 07974

Filed Aug. 16, 1973, Ser. No. 388,988

Int. Cl.² F02B *53/04*

U.S. Cl. 123—8.05 **3 Claims**



1. An engine comprising a combustion chamber having an inner surface, a rotor within said chamber for rotation through 360° about an axis, a pair of mutually intersecting vanes, said vanes being received within said rotor for sliding motion in radial directions and for movement with said rotor, said vanes having a common line of intersection that is coincident with said rotation axis, said vanes having tips that define the shape of said combustion chamber inner surface as said vane tips sweep through 360°, said combustion chamber further comprises a fuelair mixture inlet, a manifold for supplying said fuel air mixture to the engine through said inlet, a carburetor coupled to said manifold for mixing air with said fuel, a supercharger for supplying air at greater than atmospheric pressure to said carburetor, an exhaust manifold for leading the products of a burnt fuel-air mixture from said combustion chamber, a turbine coupled to said exhaust manifold to extract power from said burnt fuel-air mixture, said turbine also being coupled to said supercharger in order to drive said supercharger, and a throttle interposed in said exhaust manifold to regulate the back pressure in said combustion chamber.

3,908,609

ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM FOR ROTARY ENGINES

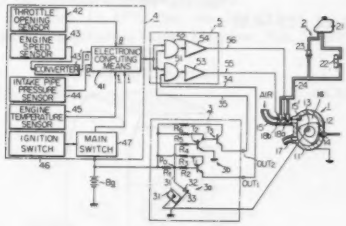
Hiroyoshi Iwata, and Yoshikazu Ishikawa, both of Tokyo, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed June 6, 1973, Ser. No. 367,384

Claims priority, application Japan, June 7, 1973, 47-67685[U]

Int. Cl.² F02B *53/10*

U.S. Cl. 123—8.09 **1 Claim**



1. An electronically controlled fuel injection system associated with a rotary combustion engine comprising:

a plurality of fuel injection valves for supplying fuel to the engine;

actuating means for actuating each of said fuel injection valves when said means are energized;

an electric circuitry device which comprises an engine driven triggering means having a cam coupled with a crank shaft of said engine and two contacts of a triggering switch which are alternately connected and disconnected with each other in dependence on the revolution of said crank shaft to produce alternate pulse signals and an electric switching circuit responsive to said alternate pulse signals from said engine driven triggering means to produce sequential triggering pulse signals;

electronic computing means receiving input signals from at least one of an engine speed sensor, a throttle opening sensor, an engine temperature sensor and an intake pipe pressure sensor to produce an electronic output pulse signal having a pulse width representing a proper duration for fuel injection and corresponding at all times to prevailing engine operating conditions; and

electronic control means responsive to said output pulse signal from said computing means and said sequential triggering pulse signals from said electric switching circuit of said electric circuitry device to produce sequential command pulse signals which are fed to said actuating means to thereby sequentially actuate said fuel injection valves, wherein said electric switching circuit has first and second transistor circuits which are rendered non-conductive when said contacts of said triggering switch are closed so that no triggering pulse voltage signal appears at a first output terminal of said electric circuitry device and wherein said electric switch circuit has a third transistor circuit which is rendered conductive when said contacts are closed and a triggering pulse voltage signal is delivered from said third transistor circuit to a second output terminal of said electric circuitry device, and said first and second transistor circuit being rendered conductive, to deliver a triggering pulse voltage signal to said first output terminal, when said contacts are open and simultaneously said third transistor circuit is rendered non-conductive so no triggering pulse voltage signal is delivered to said second output terminal wherein said electronic control means has at least two AND circuit simultaneously receiving said electronic output pulse signal from said electronic computing means and, respectively, receiving said triggering pulse voltage signals from said first and second output terminals of said electric circuitry

device to thereby sequentially deliver command pulse signals to said actuating means.

3,908,610

HOUSING FOR A ROTARY ENGINE

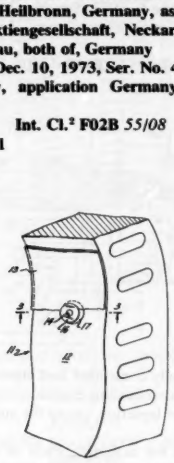
Hermann Stahle, Heilbronn, Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Neckarsulm and Wankel, G.m.b.H., Lindau, both of, Germany

Filed Dec. 10, 1973, Ser. No. 423,160

Claims priority, application Germany, Dec. 21, 1972, 2262618

Int. Cl.² F02B *55/08*

U.S. Cl. 123—8.01 **2 Claims**



1. A peripheral housing shell, for use in a rotary internal combustion engine having a housing comprising a peripheral shell and a pair of end walls defining an engine cavity, and a rotor disposed in the engine cavity and having sealing means sweeping the inner surface of the peripheral shell in sealing relation therewith, wherein the improvement comprises:

a. the peripheral shell being formed of a lightweight basis metal with its inner surface coated with a layer of hard material forming the sealing surface swept by the rotor sealing means;

b. the peripheral shell having at least one spark plug recess therein and an ignition channel communicating between the spark plug recess and the engine cavity with its orifice at the sealing surface;

c. the basis metal of the shell having an island of the basis metal protruding from its inner surface through the hard coating layer and surrounding the orifice of the ignition channel, the surface of the island being flush with the sealing surface; and

d. the island having a sloping side wall between its surface and the inner surface of the peripheral shell, the sloping side wall being covered by the hard coating material.

3,908,611

COLD STARTING DEVICE OF A ROTARY PISTON INTERNAL COMBUSTION ENGINE

Seiki Mukai, and Hironori Koge, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Continuation-in-part of Ser. No. 240,023, March 31, 1972, abandoned. This application Dec. 3, 1973, Ser. No. 420,837

Claims priority, application Japan, Mar. 31, 1971, 46-23955[U]

Int. Cl.² F02B *53/00;* **F02N** *17/08*

U.S. Cl. 123—8.13 **2 Claims**

1. A cold starting device for a rotary piston internal combustion engine, said engine comprising: a casing having a trochoidal inner peripheral surface, and a rotor disposed in the casing for planetary rotation and having apex seals in sliding contact with the trochoidal inner peripheral surface so as to define working chambers between the casing and the rotor, the improvement comprising:

a. a battery;

b. a starter motor for cranking the engine during engine starting by motor energization;

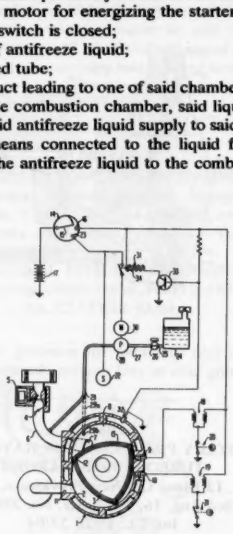
c. a starter switch operatively connected to said battery and said starter motor for energizing the starter motor when the starter switch is closed;

d. a supply of antifreeze liquid;

e. a liquid feed tube;

f. an intake duct leading to one of said chambers which acts as an engine combustion chamber, said liquid feed tube coupling said antifreeze liquid supply to said intake duct;

g. pump means connected to the liquid feed tube for supplying the antifreeze liquid to the combustion chamber of the engine through said intake duct during pump operation to prevent moisture from freezing on the trochoidal inner peripheral surface and to dissolve ice formed thereon;



h. means electrically connecting said pump means to the starter switch such that the pump means operates at the same time that the starter motor is energized;

i. a thermosensor for detecting engine temperature; and

j. means operatively electrically connecting said thermosensor to said pump means such that when the temperature detected by the thermosensor reaches a predetermined temperature, said pump means is disconnected from said battery.

3,908,612

ROTARY PISTON INTERNAL COMBUSTION ENGINE

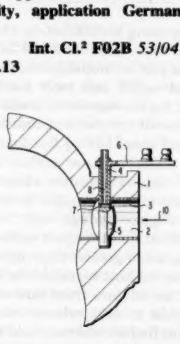
Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 254,545, May 18, 1972, abandoned. This application Mar. 28, 1974, Ser. No. 455,537

Claims priority, application Germany, May 21, 1971, 2125353

Int. Cl.² F02B *53/04*

U.S. Cl. 123—8.13 **24 Claims**



1. A rotary piston internal combustion engine comprising: a piston accommodating housing,

a rotary piston rotatably movable within said housing,
inlet channel means for admitting the fuel and air supply into said housing,
exhaust channel means for accommodating discharge of exhaust gases from said housing,
said exhaust channel means opening into said housing at a position spaced ahead of the opening of said inlet channel means into said housing with respect to the travel direction of said piston,
a throttle valve member arranged in said inlet channel means for controlling the opening thereof,
and lubricating oil supply means for supplying lubricating oil to said inlet channel means, said lubricating oil supply means including bore means opening into said inlet channel means at an oil outlet position spaced from channel walls delimiting said inlet channel means, said channel walls including a first wall portion disposed at the side of the inlet channel means closest to said exhaust channel means and a second wall portion disposed at the side of the inlet means furtherest from said exhaust channel means, said oil outlet position being closer to said second wall portion than to said first wall portion.

3,908,613

METHOD OF FEEDING AN INTERNAL COMBUSTION ENGINE AND IMPROVED APPARATUS FOR PERFORMING THE SAME

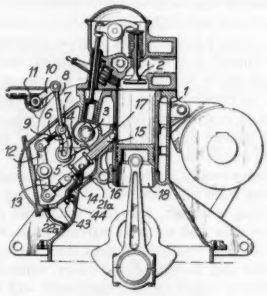
Gilbert Maurice Loby, 2, rue de la Touche, Renaze, France

Filed May 26, 1971, Ser. No. 146,991

Claims priority, application France, June 25, 1970, 70.23525

Int. Cl. F02d *19/00, 47/00, 25/02*

U.S. Cl. 123—25 C **9 Claims**



1. A dual injector mechanism for feeding a cylinder of an internal combustion engine comprising:
a dual injector body having a conical seat;
a fuel inlet;
a fuel passage formed in the body;
a detonation inhibitor inlet;
a detonation inhibitor passage formed in the body and parallel to the fuel passage;
a single needle mounted in the body and having a head received in the seat;
means for moving the needle;
a lubricating oil inlet formed in the body;
a lubricating oil discharge orifice formed in the body;
a first bearing surface formed on the needle;
a second bearing surface formed on the needle and spaced apart from the first bearing surface; and
wherein each of the passages has a calibrated orifice formed behind the head and at different levels from the seat, the single needle near-simultaneously uncovering both orifices to deliver a homogeneous atomized mixture of fuel and inhibitor to the cylinder when at the bottom of its stroke, and the two bearing surfaces define an oil inlet space, one of the bearing surfaces being disposed behind the head portion of the injector needle which uncovers the oil discharge orifice when the injector is in its shut-off position.

3,908,614

THROTTLE ANGLE TRANSDUCERS

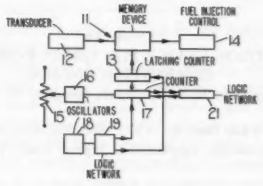
John Michael Ironside, Birmingham, and Michael Herbert Cops, Solihull, both of England, assignors to Lucas Electrical Company Limited, Birmingham, England

Filed Feb. 13, 1973, Ser. No. 332,091

Claims priority, application United Kingdom, Feb. 25, 1972, 8937/72

Int. Cl.² F02M *51/00*

U.S. Cl. 123—32 EA **1 Claim**



1. A throttle angle transducer which can be used in a fuel injection system for a vehicle having a throttle pedal, and which has a nonlinear output which changes more rapidly at small throttle angles than at large throttle angles, said transducer comprising in combination a linear potentiometer having movable thereon a slider which is driven by the throttle pedal which determines said throttle angle, an oscillator, means coupling said oscillator to said slider, said potentiometer determining the period of said oscillator, whereby said period varies linearly with the position of said slider, and an output stage coupled to said oscillator, said output stage providing an output signal which varies linearly with the frequency of the oscillator, the frequency of said oscillator being determined solely by its period, said output stage effecting digital measurement of said oscillator frequency and including means comprising a digital counting device for counting to a value representing the oscillator frequency at any given instance, the shape of the frequency against the throttle angle curve being determined by the output of means for subtracting a fixed digital number from each digital count.

3,908,615

BALL ENDED PUSH ROD WITH CONTROLLED OIL FLOW

Norman G. Hayward, 11414 Mercury Dr., Manassas, Va. 22110

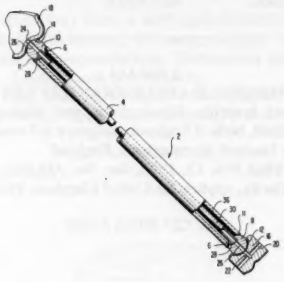
Continuation-in-part of Ser. No. 394,805, Sept. 6, 1973. This application May 2, 1974, Ser. No. 466,209

Int. Cl.² F01M *1/06*

U.S. Cl. 123—90.35 **7 Claims**

5. A push rod for actuating a poppet valve of an engine and for transmitting oil, comprising
an elongate hollow tube having abutment means at opposite ends thereof, and means providing a passage from end-to-end through said tube and abutment means,
the means providing a passage comprising a second tube

whose outer diameter is less than the inner diameter of the first-mentioned tube, and means securing opposite



ends of the second tube in said abutment means, the space between said diameters being hollow.

3,908,616

IGNITION DEVICE FOR USE IN INTERNAL COMBUSTION ENGINE

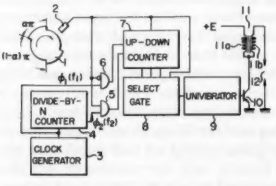
Takao Sasayama, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 11, 1973, Ser. No. 423,774

Claims priority, application Japan, Dec. 18, 1972, 47-126114

Int. Cl.² F02P *3/02*

U.S. Cl. 123—117 R **16 Claims**



1. An ignition device for an internal combustion engine comprising:

an ignition coil having a primary winding and a secondary winding;

switching means provided in series with said primary winding of said ignition coil for introducing electric current to said primary winding from a DC power supply and for interrupting it;

pulse producing means for producing pulses having a duration corresponding to a predetermined engine crank angle;

first clock means for producing a first clock signal;

second clock means for producing a second clock signal;

first counting means for counting the first clock signal from said first clock means during a time period corresponding to the duration of the pulses from said pulse producing means;

second counting means for counting the second clock signal from said second clock means responsive to the fact that the production of pulses by said pulse producing means is stopped ;

means for detecting the fact that the difference between the count value of said first counting means and the count value of said second counting means reaches a predetermined value; and

control means for on-off controlling said switching means responsive to the output of said detecting means thereby generating a high voltage at the secondary winding of said ignition coil.

3,908,617

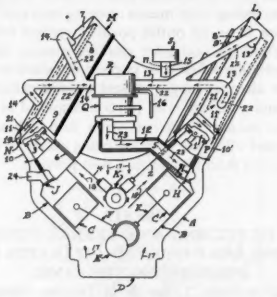
TOTAL VENTILATING AND SCAVENGING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Drexel C. Partridge, P.O. Box 773, San Leandro, Calif. 94577

Filed Dec. 14, 1973, Ser. No. 424,836

Int. Cl.² F02F *9/00;* **123** *119 B;198 E;195 C;90.38*

U.S. Cl. 123—119 B **4 Claims**



1. The combination with an internal combustion engine having a carburetor for feeding and metering a combustible mixture to the engine cylinders and a cover enclosing the rocker arms that actuate the intake and exhaust valves;

a. a first sole air feeding means for said carburetor and including a conduit communicating with the top interior of said cover and with said carburetor;

b. a second sole atmospheric air feeding means for delivering air to the interior of the engine adjacent to one end of the engine crankcase, said engine having passages leading from the crankcase to the interior of said cover so that the air passing through the crankcase will pick up any gaseous vapors therein for scavenging the crankcase;

c. a baffle spaced below the top interior of said cover and disposed above the rocker arms, the plane of said baffle being downwardly inclined from a horizontal plane and extending from one side wall of said cover and having a lip forming a trough, spaced a measured distance from the other side wall so as to provide a space between the trough and the wall of less area than the space between said baffle and the top of said cover, whereby the air and any gaseous vapor carried therewith will be caused to pass more rapidly through the space between the trough and the adjacent wall and will slow down immediately upon entering the larger space above the baffle so that the slowing down of the air with its vapors will cause the heavier vapors to precipitate out from the air and drop onto said baffle, the remaining lighter vapors in the air being conveyed by said first conduit to the carburetor, this conduit being the only source of air and any vapor supply to the carburetor.

3,908,618

TORCH-IGNITION RECIPROCATING-PISTON TYPE INTERNAL COMBUSTION ENGINE

Shoji Tange, and Meroji Nakai, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 25, 1974, Ser. No. 445,161

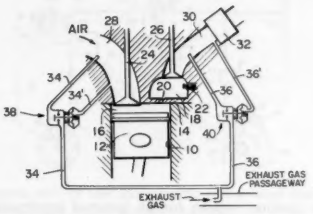
Claims priority, application Japan, Feb. 26, 1973, 48-22971

Int. Cl.² F02B *25/06*

U.S. Cl. 123—119 A **1 Claim**

1. A torch-ignition internal combustion engine of the type having a cylinder with a piston reciprocally slidable there-

within, a cylinder head defining a combustion chamber in conjunction with the cylinder and the piston, a first combustible mixture constituent induction passageway opening into the combustion chamber, a second combustible mixture constituent induction passageway opening into an antechamber formed in the cylinder head having ignition means therewithin, the antechamber opening into the combustion chamber through a constriction, and an exhaust gas passageway leading from the combustion chamber to the atmosphere, comprising:



a first recirculation passageway leading from the exhaust gas passageway into the first induction passageway and having a first valve therewithin; and

a second recirculation passageway leading from the exhaust gas passageway into the second induction passageway and having a second valve therewithin;

said first and second valves being adapted to be responsive to the engine load, whereby said first valve opens only under high load engine operation to recirculate exhaust gas into the combustion chamber, and said second valve opens only under medium and high load engine operation to recirculate exhaust gas into the antechamber.

3,908,619

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

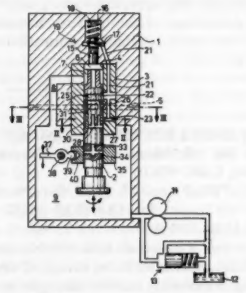
Hans Bittelmeyer, Schwaigern, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 3, 1974, Ser. No. 511,532

Claims priority, application Germany, Oct. 3, 1973, 23495810

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 BD **1 Claim**



1. A fuel injection pump for internal combustion engines, comprising:

a. a housing including a plurality of fuel delivery channels formed therein;

b. a cylindrical bushing with a central bore, said bushing being contained within the housing and provided with an internal connecting channel having a first outlet aperture and a second outlet aperture, and a plurality of radial channels communicating with said fuel delivery channels in said housing;

c. a spring-loaded check valve located in said housing and disposed between said central bore and said connecting channel within said bushing; and

d. a pump piston slidingly disposed within the central bore of said bushing so as to be capable of simultaneous rotational and reciprocating motion, said pump piston including:

i. a first annular groove in the outer surface thereof, so located as to communicate with said first outlet aperture of said bushing;

ii. a longitudinal distributing groove in the outer surface thereof communicating with said first annular groove, whereby, during the rotation of said pump piston, said longitudinal distributing groove sequentially communicates with one of said radial channels in said bushing, for fuel delivery to one of said fuel delivery channels, during the pressure stroke of the piston;

iii. a partial annular groove in the outer surface thereof, so located as to establish communication among several ones of said plurality of radial channels in said bushing;

iv. a second annular groove in the outer surface of the piston; and

v. a plurality of longitudinal grooves distributed in the outer surface of the piston, each communicating with said second annular groove, and one of them communicating with said partial annular groove, whereby, during rotation of the pump piston, each of said plurality of longitudinal grooves communicates in sequence with said second outlet aperture in said bushing so as to establish a communication between said internal connecting channel within said bushing and said partial annular groove in the outer surface of the pump piston during the suction stroke thereof.

3,908,620

INTAKE MANIFOLD

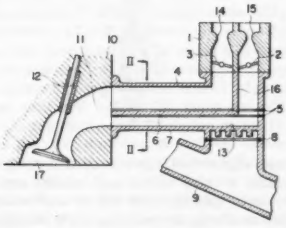
Takehiko Maekawa; Masahiko Nakada, and Hirofumi Matsumoto, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 21, 1973, Ser. No. 371,998

Claims priority, application Japan, July 26, 1972, 47-74128

Int. Cl. F02b *19/10;* **F02m** *31/00*

U.S. Cl. 123—122 AB **1 Claim**



1. An intake manifold assembly for an internal combustion engine including exhaust gas conduit means and utilizing a carburetor having primary and secondary passage means through which an air-fuel mixture is delivered to said engine, said assembly comprising a housing receiving said air-fuel mixture from said carburetor, means defining said housing with a primary manifold passage in direct flow communication with said carburetor primary passage means and with a secondary manifold passage in direct flow communication with said carburetor secondary passage means, said primary and said secondary manifold passages being defined over at least

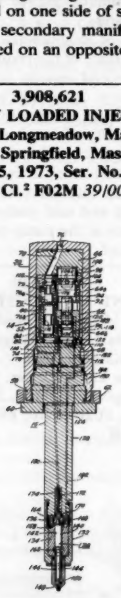
portions thereof by a pair of sections having a generally concave cross-sectional configuration each including a pair of laterally extending flanges at which said concave sections are joined together, means defining a heating section contiguous to said primary manifold passage, with a wall extending to separate said heating section and said primary manifold passage, said wall defining on one side thereof a portion of the interior of said primary manifold passage and on the opposite side thereof a portion of the interior of said heating section, said wall being formed on said opposite heating section side with a plurality of heat transmission fin members extending into said heating section, means connecting said heating section in flow communication with said exhaust gas conduit means to direct exhaust gases from said engine into said heating section thereby to effect heating of said air-fuel mixture flowing in said primary manifold passage by heat transmission from said exhaust gases, and heat insulation means extending to insulate said primary manifold passage from said secondary manifold passage to block transfer to said secondary manifold passage of the heat transmitted to said primary manifold passage from said exhaust gases, said heat insulation means being mounted between said laterally extending flanges to separate said primary and secondary manifold passages, with gasket means being provided between said flanges and said insulating means, said assembly being configured and arranged with said heating section located on one side of said primary manifold passage and with said secondary manifold passage and said insulation means located on an opposite side thereof remote from said one side.

3,908,621

HYDRAULICALLY LOADED INJECTOR NOZZLE

Russell B. Hussey, East Longmeadow, Mass., assignor to AMBAC Industries, Inc., Springfield, Mass.

Filed Apr. 25, 1973, Ser. No. 354,396
Int. Cl.² F02M *39/00*
U.S. Cl. 123—139 R **8 Claims**



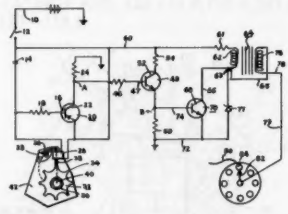
1. In a diesel engine fuel injection system comprising a fuel injection nozzle, a valve within said nozzle, and means for supplying metered quantities of fuel to said nozzle valve in timed relation to an engine operating cycle at a high injection pressure varying with engine load, said means comprising a source of high pressure fluid varying with engine load, said valve being adapted to open upon presentation thereto of the high pressure metered fuel, the improvement comprising means providing a variable closing force to said nozzle valve after the engine starting cycle, said latter means comprising said source of high pressure fluid, means operable to convert said high pressure fluid into a closing force acting on said nozzle valve to close said valve, and means for maintaining a substantially constant proportional relationship of the pressure of said high pressure fluid and the injection pressure of the fuel, thereby providing a variation of the nozzle closing force with engine load.

3,908,622

IGNITION SYSTEM

Leslie T. Long, Orange, Calif., assignor to Hays Enterprises, Midway City, Calif.

Filed July 26, 1973, Ser. No. 382,824
Int. Cl. F02p *3/02*
U.S. Cl. 123—148 E **14 Claims**



1. An ignition system for an internal combustion engine having a storage battery, a distributor and coil with primary and secondary windings with connector means between the high tension post of the secondary and the rotor of the distributor which comprises:

a. primary circuit means to supply battery voltage to the primary of said coil;

b. a switching transistor with the emitter and collector thereof connected in circuit in said circuit means;

c. base biasing circuit means biasing said switching transistor inot a non-conducting mode;

d. voltage pulse generating means comprising a magnetic field, means to vary the magnetic flux of said field in response to the rotational speed of an engine and to generate a cyclic variation of said magnetic flux for each cylinder of said engine in a timed manner and pick-up coil means positioned in said field for generation of a timed train of induced voltage pulses responsive to said cyclic variation of said magnetic flux;

e. amplifier means normally biased into a non-conducting mode; and connected for conduction in response to said voltage pulses, whereby said voltage pulses generate a timed train of amplified pulses from said amplifier; and

f. means to apply said train of amplified pulses to said base biasing means of said switching transistor to forward bias said switching transistor momentarily into a conducting mode only during the duration of each of said voltage pulses thereby applying battery current to the said primary windings of said coil for momentary periods sufficient to reach substantial saturation current in said primary.

3,908,623

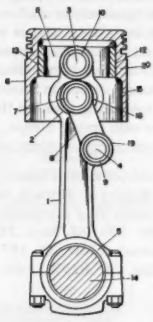
ADVANCED RECIPROCATING ENGINE SYSTEM

Edward M. McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95610

Filed Aug. 23, 1974, Ser. No. 499,909
Int. Cl.² F02B *75/32*
U.S. Cl. 123—197 A **3 Claims**

1. A piston, a piston slide in slidable contact with the interior surfaces machined in the crown of said piston, a slide pin extending transversly across said piston slide each end of which is pivotally mounted in said piston slide, a connecting rod having a small journal at one end which holds said slide pin, below said small journal an opening in said connecting rod, below said opening and position to one side of the longitudinal axis of said connecting rod a second small journal on said connecting rod said second small journal holding a rod pin, a connecting link being pivotally journaled to each end of said rod pin, at the opposite end of said link a piston pin also pivotally journaled in said connecting link, said piston pin and connecting link journal pass through the said opening of said

connecting rod and extend transversly across said piston, said piston pin being pivotally journaled at each end in said piston,



at the opposite end of said connecting rod a large journal for rotatively mounting on an engine crankpin.

3,908,624

INTERNAL COMBUSTION ENGINE

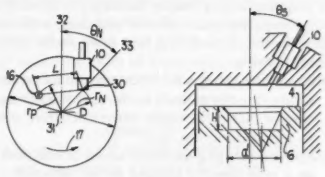
Masataka Miyake, Inazawa; Shigeichi Okada, Nagoya; Yoshitaka Kawahara, Nagoya, and Katsutoshi Asai, Nogoya, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 126,771, March 22, 1971, abandoned. This application Nov. 14, 1973, Ser. No. 415,789

Claims priority, application Japan, Mar. 23, 1970, 45-23577

Int. Cl.² F02B *17/00;* **F02M** *59/20*

U.S. Cl. 123—32 ST **10 Claims**



1. An internal combustion engine which includes a cylinder, housing a movable piston means for introducing air into a combustion chamber in the cylinder in a manner to generate vortical flow around the periphery of the combustion chamber, a fuel injection nozzle for injecting fuel into the combustion chamber in a direction so that the fuel has a component of velocity in a direction opposite to the direction of the vortical air flow in the vicinity of the fuel injection nozzle, and a sparking plug for igniting the combustible mixture formed on mixing of the fuel and the air, in which the fuel injection nozzle is situated so that

1. $2r_N/D$ has a value in the range of from ⅓ to ¾ inclusive, where r_N is the distance between the tip of the injection nozzle and the center of the combustion chamber and D is the bore of the combustion chamber;
2. θ_N has a value in the range of from 0° to 60° inclusive where θ_N is the angle between a radius of the combustion chamber which is parallel to the axis of the fuel injection nozzle and a radius of the combustion chamber which extends through the tip of the fuel injection nozzle;
3. θ_S has a value in the range of from 0° to 45° inclusive, where θ_S is the angle between the axis of the fuel injection nozzle and the axis of the cylinder; the sparking plug is situated so that
4. $2r_p/D$ has a value in the range of from ¼ to ¾ inclusive, where r_p is the distance between the sparking plug and the center of the combustion chamber D d is as defined above;

and the distance L between the tip of the fuel injection L and the sparking plug lies within the range of from 10 to 60 mm. inclusive.

3,908,625

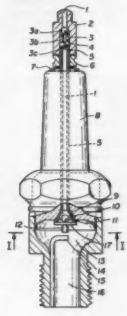
SPARK PLUG WITH BUILT-IN PRECOMBUSTION CHAMBER

Stephen Romy, 71-23 Manse St., Forest Hills, N.Y. 11375

Filed Feb. 25, 1974, Ser. No. 445,616

Int. Cl.² F02P *1/00*

U.S. Cl. 123—32 SP **27 Claims**



1. A spark plug comprising:

an electrically conductive shell member (15);

a precombustion chamber (13) formed within said shell member (15), said shell member having a gas passage (16) leading out from said precombustion chamber (13); an elongated electrically insulating sleeve (8) extending in a direction away from said gas passage (16) and precombustion chamber (13);

electrode means (12,14) at least partially located within said precombustion chamber (13);

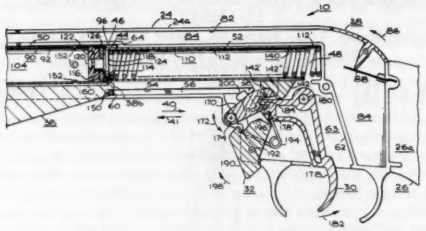
means for feeding fuel into said precombustion chamber (13) for ignition by said electrode means, said fuel feeding means including means (5) defining an elongated fuel passage passing substantially axially through said elongated insulating sleeve (8) and terminating at said precombustion chamber (13); and means (2) for feeding fuel to the end of said fuel passage defining means (5) remote from said precombustion chamber (13); and

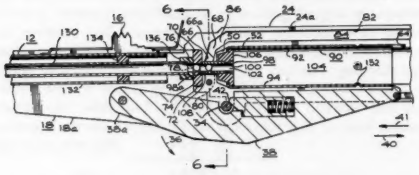
metering means at the end portion of said fuel passage defining means (5) which is remote from said precombustion chamber (13) for adjustably metering the feeding of fuel to said precombustion chamber (13), said metering means including a variable diameter rod means (3) selectively communicating with the interior of the defined fuel passage, said rod means (3) being movably mounted relative to said fuel passage defining means (5) for movement in the axial direction of said fuel passage, said rod means having at least two portions (3*b*,3*c*) of different diameters and being movable responsive to vacuum in said precombustion chamber (13) for selectively communicating said different diameter portions with said fuel passage defining means (5) for varying the size of the fuel feeding passage in the vicinity of said rod means between a minimum fuel flow position at which a predetermined minimum amount of fuel is permitted to flow through said fuel passage and a maximum fuel flow position at which a predetermined maximum amount of fuel is permitted to flow through said fuel passage, and biasing means (4) biasing said rod means (3) relative to said fuel passage defining means (5) such that said metering means is in said maximum fuel flow position under low vacuum conditions in said precombustion chamber and is in said minimum fuel flow position under high vacuum conditions in said precombustion chamber.

3,908,626
AIR GUN MECHANISM ARRANGEMENT

William D. Hammond, San Juan Capistrano, Calif., assignor to L & R Industries, Torrance, Calif.

Filed May 21, 1973, Ser. No. 362,421
Int. Cl.[2] F41B *11/00*
U.S. Cl. 124—15 13 Claims





1. An air operated gun mechanism comprising, in combination:

a housing;

a compression tube means slidably mounted in said housing for reciprocating motion between a firing position and a retracted position, and having a forward end having first walls defining an air passage aperture;

a plunger means slidably mounted in said housing for reciprocating motion between a firing position and a retractd position, and said plunger means having a forward position slidably mounted in said compression tube means and having a predetermined frictional force therebetween, and said forward portion adjacent said forward end of said compression tube means for the condition of said plunger means and said compression tube means in said firing position thereof, and said compression tube means free of air passage ways communicating with regions external thereof other than said air passage aperture intermediate said forward end of said compression tube means and said forward end of said plunger means;

cocking means movably mounted in said housing for moving said plunger means from said firing position to said retracted position by movement of said cocking means in a first direction, and said predetermined frictional force between said plunger means and said compression tube means being of such magnitude that when said plunger means is moved by said cocking means from said firing position of said plunger m ns to said retracted position thereof, said friction force moves said compression tube means from said firing position thereof to said retracted position thereof with said compression tube means free of engagement with said cocking means for said movement between said firing position of said compression tube means and said retracted position thereof, and said cocking means moving said compression tube means from said retracted position to said firing position by movement of said cocking means in a second direction opposite said first direction;

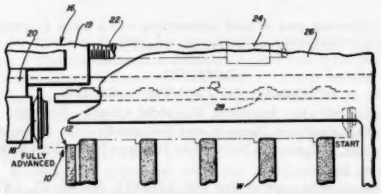
spring means for resiliently resisting movement of said plunger means from said firing position to said retracted position, and said spring means in a compressed condition for the condition of said plunger means in said retracted position, and said spring means extendable to an extended position to drive said plunger means from said retracted position to said firing position; and

trigger means manually actuable for releasably holding said plunger means in said retracted position thereof to releasably hold said spring means in said compressed condition thereof, and actuating said trigger means releases said spring means to drive said plunger means into said firing position thereof, and said movement of said cocking means in said second direction moves said compression tube means into said firing position thereof free of spring forces thereon by said spring means.

3,908,627
MACHINE TOOL

Ralph E. Price, and Robert E. Bricker, both of Waynesboro, Pa., assignors to Landis Tool Company, Waynesboro, Pa.

Division of Ser. No. 399,888, Sept. 24, 1973, Pat. No. 3,872,738. This application Nov. 20, 1974, Ser. No. 525,348
Int. Cl.[2] B29B *53/00*
U.S. Cl. 125—11 TP 3 Claims



1. A rotary dresser tool comprising

a dressing element,

means including a feed screw for displacing said dressing element,

means for displacing said feed screw including

first stepping motor means including a drive shaft,

second stepping motor means including a drive shaft,

means for interconnecting said drive shafts and said feed screw having

means for rotating said feed screw in a first direction at a rate directly related to the combined rates of rotation of said drive shafts when said drive shafts rotate in a first direction, and

means for rotating said feed screw in said first direction at a rate directly related to the difference between the rates of rotation of said drive shafts when one of said drive shafts is rotated in said first direction at a first rate and the second of said drive shafts is rotated in a second reverse direction at a second rate less than said first rate,

means for selectively and conjointly rotating said first and second stepping motor means in said first direction to advance said feed screw at a first speed, and

means for selectively rotating said first stepping motor means in said first direction at said first rate and for selectively rotating said second stepping motor means in said second direction at said second rate, said first and second rates being selected so that said feed screw will be advanced at a second slower speed.

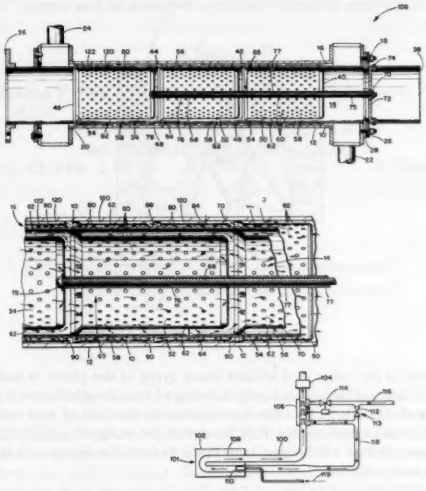
3,908,628
JET IMPINGEMENT RECUPERATOR

Lazaros J. Lazaridis, Lincoln; Maurice Nunes, Arlington, and Sander E. Nydick, Stow, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Oct. 16, 1973, Ser. No. 407,027
Int. Cl. F24c *3/00*; F28d *7/10*
U.S. Cl. 126—91 A 16 Claims

1. A controlled atmosphere radiant tube heating device comprising a fuel burner means, air intake means for injection of combustion air into the burner means, a radiant tube heated by combustion products from the burner means, an exhaust tube for conducting combustion products from the radiant

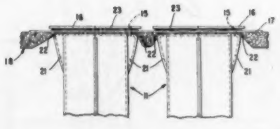
tube, a length of the wall of the exhaust tube forming a heat exchange surface on each side thereof, an outer tube concentric with and surrounding the exhaust tube forming an exterior conduit for confining a flow of combustion air adjacent the heat exchange surface, means for directing the flow of combustion air into the exterior conduit at an inlet end thereof, means for directing the flow of combustion air from the exterior conduit at an outlet end thereof to the burner means, baffle means interior of the exhaust tube, the baffle means having openings therein for directing jets of combustion products onto said length of the wall, the openings having hydraulic diameters not less than one-eighth inch and not greater than one-half inch, the ratio of separation of centers of mass of the openings to the hydraulic diameter of the openings being not less than two or more than seven.



3,908,629
HOT AIR FURNACE WITH IMPROVED HEAT EXCHANGER CONSTRUCTION

John M. Wiese, St. Louis, Mo., assignor to The Singer Company, New York, N.Y.

Filed Nov. 30, 1973, Ser. No. 420,756
Int. Cl.² F24H 9/14; F16L 5/00
U.S. Cl. 126—119 3 Claims

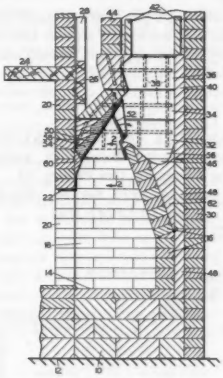


1. In a hot air furnace which includes at least one heat exchange unit having at least one mounting flange section defining an opening therein, and at least one plate member having an aperture therein accommodating said mounting flange section of said heat exchange unit projecting therethrough and connected to said heat exchange unit, the improvement which comprises a layer of insulating material extending parallel and juxtaposed to a major portion of said plate member adjacent to said aperture, said layer of insulating material extending through said aperture and interposed between said at least one plate member and the mounting flange section of said heat exchange unit, an outer portion of said flange section of said heat exchange unit projecting through said plate member being expanded about said aperture to thereby secure said plate member to said heat exchange unit and said insulating material extending between the plate member and the expanded outer portion of said mounting flange section so as to effect a leakproof joint between said heat exchange unit and said plate member.

3,908,630
FIREPLACE DAMPER CONE

Alvin J. Burcham, Eugene, Oreg., assignor to Calvin G. Banton and Stephen G. Banton, both of Junction City, Oreg.

Continuation of Ser. No. 139,785, May 3, 1971, abandoned. This application Aug. 12, 1974, Ser. No. 496,575The portion of the term of this patent subsequent to Nov. 30, 1992, has been disclaimed.
Int. Cl.² F24B 7/00
U.S. Cl. 126—120 3 Claims



1. In a fireplace having a firebox including a hearth and side and back walls supported on a base and defining front and top openings, the combination therewith of

a. a substantially unitary, pre-cast, hollow damper cone member overlying the firebox top opening, the inner front surface of the cone member being inclined upward toward the rear,

b. side and back support members mounted on the base and extending upward therefrom adjacent the outer side of the side and back walls of the firebox independently of said firebox walls,

c. the upper ends of said support members supporting the cone member independently of the firebox walls, whereby to afford replacement of said firebox walls independently of the cone member,

d. a damper member registering with the firebox top opening and mounted on the side walls of the firebox under said inclined inner front surface of the cone member, whereby to afford replacement of the damper member independently of the cone member, and

e. flue means registering with the upper open end of the cone member.

3,908,631
METHOD AND APPARATUS FOR CONVERTING SOLAR RADIATION TO HEAT ENERGY

Frank E. Rom, 171 Belmar Blvd., Avon Lake, Ohio 44012

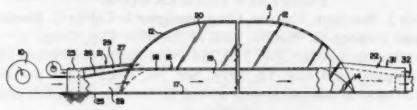
Filed Mar. 12, 1974, Ser. No. 450,424
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 9 Claims

1. Apparatus for converting solar radiation into thermal energy for heating a gaseous stream comprising:

at least one elongated, inflatable heating conduit formed of solar-radiation-absorbing film and adapted to be placed on the ground and inflated by the pressure of a gaseous stream being conveyed therethrough,

an elongated sheet of solar-radiation-transparent film positioned over said conduit and adapted to form therewith an inflatable closure between said conduit and the surrounding atmosphere,

means for conveying a gaseous medium through said conduit to be heated therein, under pressure sufficient to inflate said conduit,



means providing an outlet for heated gaseous medium from said conduit,

means for introducing a gas under pressure into said enclosure to inflate said enclosure around said conduit, and

means providing an outlet path from said enclosure to said conduit outlet for introducing heated gas at a low rate from said enclosure into said conduit outlet.

3,908,632

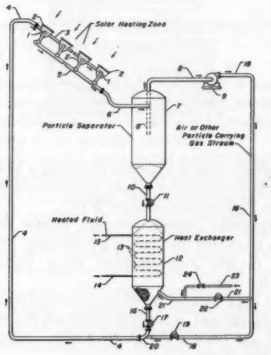
SOLAR HEAT ABSORBING SYSTEM

Harold W. Poulsen, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 24, 1974, Ser. No. 482,121

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **9 Claims**



1. A method for effecting the recovery of solar heat which comprises:

a. passing a gaseous carrying stream with entrained black body particles to a heating zone for exposure to solar radiant energy,

b. passing said stream with resulting heated particles from said heating zone to a particle separation zone and effecting a separation to provide a particle stream and a primarily particle free stream,

c. passing the particle stream from the latter zone to a heat exchange zone and recovering heat therefrom,

d. subsequently passing the resulting cooled particle stream to a mixing zone and therein combining it with the particle free stream obtained from said separation zone, and

e. then recirculating the recombined particle containing stream to said heating zone for reexposure to the solar energy.

3,908,633

FIREPLACE DAMPER ACTUATING TOOL

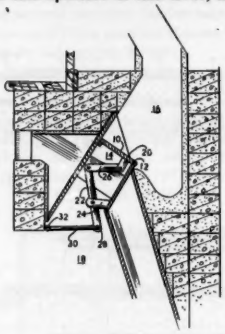
Virgie M. Ammons, Cash Valley Rd., Eglon, W. Va. 26716

Filed Aug. 6, 1974, Ser. No. 495,140

Int. Cl.[2] F23L *11/02, 13/00*

U.S. Cl. 126—288 **2 Claims**

1. In combination a fireplace damper of the type mounted in a fireplace having a lintle, said damper being actuated by a lever thrust rearwardly of the fireplace to close the damper and pulled forward to open the damper, an aperture in the end of said lever, and a tool to operate said damper, said tool comprising a shank, a foot at one end of said shank extending at substantially right angles to said shank of a size to removably engage in said aperture in said lever, and an elongated



head at the other end of said shank lying in the plane of said foot and said shank, said shank being of such length that when the damper is in its closed position, and the foot of said tool is in said aperture, the tool head may be wedged against the inner surface of the fireplace lintle to lock the damper in its closed position.

3,908,634

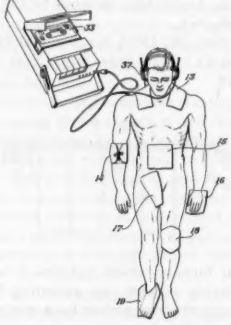
METHOD AND APPARATUS FOR INDUCING LOCALIZED ANALGESIC CONDITION

Frank J. Monaghan, 3515 Blue Bonnet Cir., Fort Worth, Tex. 76109

Continuation-in-part of Ser. No. 171,450, Aug. 13, 1971, abandoned. This application Sept. 7, 1973, Ser. No. 395,290

Int. Cl.[2] A61M *21/00*

U.S. Cl. 128—1 R **8 Claims**



1. A method of inducing an analgesic condition in a patient to relieve the patient's pain at a site of pain or prospective pain comprising the steps of:

a. drawing a patient's attention to said site and simulating the presence and pressure of a hypnotherapist by applying to the site a conformingly fitting fixation inducing means adapted therefor and supplying a force of at least 0.2 ounce per square inch to said site; and

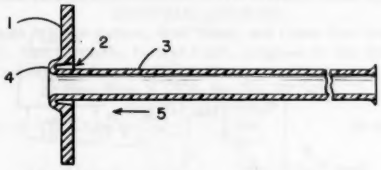
b. simultaneously auto-conditioning the patient's muscular-nervous-skeletal systems by playing to the patient, without requiring the presence of the hypnotherapist, a pre-recorded record means containing the speech that the hypnotherapist would normally make to the patient if he were present and achieving the analgesic condition; said speech referring suggestively to said fixation inducing means and its analgesic condition-inducing qualities.

3,908,635

SIMPLIFIED CATHETER

Nicholas F. Viek, Line Rd., R.D. No. 2, Box 115, Malvern, Pa. 19335

Filed June 24, 1974, Ser. No. 482,646
Int. Cl.² A61B *10/00;* **A61M** *25/00*
U.S. Cl. 128—2 M **6 Claims**



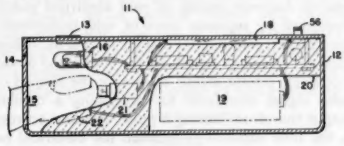
1. A catheter structure consisting of a rigid disc having front and rear surfaces and an aperture therein, said disc being adapted to be placed in contact with the area surrounding the urethra meatus with said aperture in alignment with the urethra, and a thick-walled, flexible, cylindrical tube secured to said disc with the axis of said aperture and of said tube being coextensive, the forward end portion of said tube being everted and projecting through said aperture and forwardly of said disc and being adapted to be positioned in alignment with the urethra and the major portion of said tube being inverted and extending rearwardly through said aperture and said disc, said cylindrical tube having sufficient rigidity so as to permit advancement of said tube through said aperture in said disc and to permit eversion progressively of said tube into the urethra by manually grasping said tube rearwardly of said disc and by manually pushing said tube through said aperture and into the urethra.

3,908,636

PORTABLE PULSE SENSOR

Robert E. Page, 3427 Dumas St., San Diego, Calif. 92106

Filed Feb. 15, 1974, Ser. No. 442,705
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2.05 T **7 Claims**



1. A cardiovascular instrument for audible detection of cardiovascular activity of a living subject comprising:

a case adapted for portability and unobtrusive storage upon the person of the subject;

a test station within said case for receiving an appendage of a subject under test;

an aperture in said case positioned to communicate with said test station within said case for passing an appendage of the subject therethrough into said test station;

a light source positioned within and effectively mounted on said case, adjacent said aperture, and on one side of said test station in a position to impinge an appendage of the subject inserted through said aperture into said test station with light energy;

an electro-optical transducer means positioned within said test station and effectively mounted on said case opposite and in optical alignment with said light source for being occulted by a appendage of the subject when inserted through said aperture into said test station to thereby receive light which has passed through said appendage of the subject;

circuit means attached to said case and positioned therein and electrically connected to said photoelectric transducer for receipt of electrical signals therefrom and production of larger amplitude signals having a predetermined relationship to the cardiovascular activity of the subject and including a rate determining circuit which connects said larger amplitude signals to said electro-acoustic transducer during a predetermined time interval;

electroacoustic transducer means attached to said case and positioned therewithin and electrically connected to said circuit means for producing acoustic signals in response to the larger amplitude electrical signals produced thereby;

electrical power source means mounted to and within said case and electrically connected to said light source and said circuit means for the supply of electrical operating potentials thereto; and

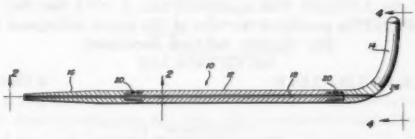
switch means attached to and positioned within said case means at the terminal end of said test station for engagement by the appendage of the subject when inserted through said aperture into said test station and electrically connected between said source of electrical power and said light source and said circuit means for establishing electrical power when the appendage of the subject is inserted and for interrupting electrical power when the appendage is withdrawn from said test station.

3,908,637

RIGID URETHRAL INSTRUMENT

Louis W. Doroshow, 7902 Ivy Ln., Baltimore, Md. 21208

Filed Apr. 22, 1974, Ser. No. 463,190
Int. Cl.² A61B *5/00;* **A61M** *3/00, 29/00, 25/00*
U.S. Cl. 128—2 F **13 Claims**

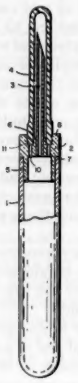


1. A surgical instrument which combines the functions of a urethral sound and a urethral catheter, the instrument comprising: an elongated cylindrical substantially linear main body portion; a curved dilating nose portion continuous with and extending from one end of said main body portion, said dilating nose portion and said main body portion being rigid and sharing a common plane; a handle portion continuous with and extending from the opposite end of said main body portion; a substantially linear passageway through said main body portion and extending substantially from said dilating nose portion to said handle portion; wherein one end of said passageway extends through the base of the dilating nose portion and emerges from said instrument on the convex side of said dilating nose portion, and wherein the other end emerges in the region of said handle portion.

3,908,638
BLOOD SAMPLING DEVICE

Alain Porcher, and Edouard Lefevre, both of Paris, France, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed June 13, 1973, Ser. No. 369,773
Int. Cl.[2] A61B 5/14; B65D 83/10
U.S. Cl. 128—2 F 6 Claims

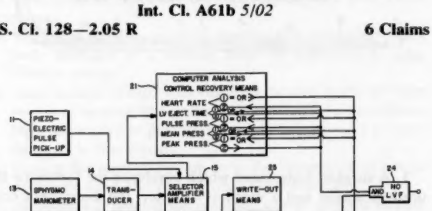


1. A blood sampling device comprising a tube closed at one end and open at the opposite end, a closure plug mounted in the open end, said plug having an air vent hole therein, and a second hole, a hollow needle fixedly supported in the second hole and extending above said tube, said needle having a central bore which communicates with the interior of the tube, and a cap positioned over the needle and the vent hole and in sealing engagement with the plug, said cap sealing said vent hole from said needle bore, external said tube.

3,908,639
DETECTING IMPAIRED HEART MECHANICAL PERFORMANCE

Kevin M. McIntyre, 111 Perkins St., Jamaica Plain, Mass. 02130

Continuation-in-part of Ser. No. 130,572, April 2, 1971, Pat. No. 3,776,221. This application Oct. 3, 1973, Ser. No. 403,202The portion of the term of this patent subsequent to Dec. 4, 1990, has been disclaimed.
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 R 6 Claims



1. A method of detecting mechanical heart impairment which method includes the steps of,

noninvasively providing a blood pressure signal representative of blood pressure by placing pressure sensitive means in contact with the skin of a patient near an artery,

differentiating said blood pressure signal,

subjecting said patient whose blood pressure is characterized by said pressure signal to a heart straining manoeuvre,

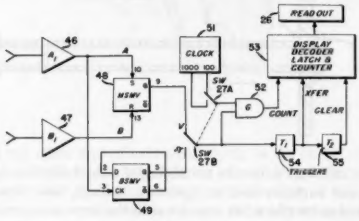
detecting the change in the amplitude of the differentiated pressure signal after initiating said straining manoeuvre from its amplitude before said manoeuvre,

and determining a probable mechanical impairment of the heart when the amplitude is not changed to a predetermined extent.

3,908,640
CARDIOVASCULAR INSTRUMENT

Robert E. Page, 3427 Dumas St., San Diego, Calif. 92106

Filed Nov. 25, 1974, Ser. No. 526,987
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 T 3 Claims



1. In a cariovascular instrument in which the aforesaid clock circuit having

a plurality of nonintrusive pulse transducers adapted to be placed at spaced locations on the body of a living animal for providing an electrical pulse signal corresponding to the circulatory pulse activity of said animal,

signal processing circuit means connected to each of said nonintrusive pulse transducers for amplifying and shaping said electrical pulse signal provided thereby,

a clock circuit for generating a timing signal having a plurality of time related pulses and two clock signal outputs,

a pulse period circuit means connected to said clock circuit and to one of said signal processing circuit means for producing a pulse period control signal between adjacent pulses of said electrical pulse signal, and

display means for displaying said pulse period as a time between adjacent pulses of said electrical pulse signal,

the improvement comprising:

an intervalometer circuit selectively connected to said signal processing circuit means for determining the time interval between pulses of said electrical pulse signals generated by separate ones of said nonintrusive pulse transducers; said intervalometer circuit including,

electrically operated switch means connected to said signal processing circuit means to receive the shaped electrical pulse signal therefrom for producing a control signal output therefrom having a pulse duration corresponding to the time separation between the electrical pulse signals,

gate circuit means connected to said electrically operated switch means to receive said control signal therefrom and effectively connected between the aforesaid clock circuit and the aforesaid display means for passage of a predetermined number of clock pulses therebetween,

a display decoder, latch, and counter circuit connected to said display means for holding a count signal between successive control signals;

a first monostable multivibrator connected between the control input of said gate circuit and said display decoder, latch and counter circuit for generating a transfer control signal pulse in response to control signals applied to said gate circuit;

a second monostable multivibrator circuit connected between said first monostable multivibrator and said display decoder, latch, and counter circuit for generating a clear control signal pulse in response to the generated transfer control signal pulse; and

a manually operable switch connected to said gate control input and the output of said electrically operated switch means and the aforesaid pulse period circuit means such that said gate circuit may be selectively controlled by the respective control output signals therefrom and also,

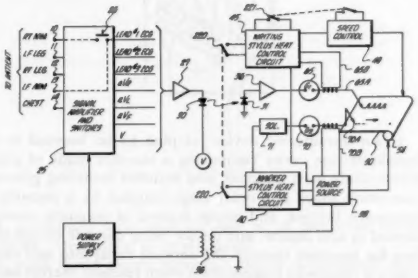
connected between said clock input of said gate circuit and the aforesaid clock circuit, whereby the appropriate one of said two clock outputs will be selected with the control output signals.

3,908,641

ELECTROCARDIOGRAPH WITH IMPROVED STYLUS CONTROL CIRCUITS

Donald William Judson, Simi Valley, and Glenn Roy Tormey, Jr., San Fernando, both of Calif., assignors to The Birtcher Corporation, Los Angeles, Calif.

Filed June 7, 1974, Ser. No. 477,255
Int. Cl.² A61B *5/04*
U.S. Cl. 128—2.06 G **10 Claims**



1. An electrocardiograph unit having means for receiving and amplifying signals derived from electrodes placed on a patient's body, a strip chart recorder supplied with heat sensitive paper and a waveform stylus for recording said waveforms in visible form, the improvement comprising:

a marker stylus provided with continuous heat when the electrocardiac unit is in operation;

means for automatically moving said marker stylus into and out of contact with said paper, thereby applying a time reference mark on the heat sensitive paper; and

means, responsive to an operator for overriding said automatic maker stylus moving means and moving said marker stylus into and out of contact with said paper under control of the operator, thereby supplying encoded marks indicative of the electrocardiograph waveform then being written on said paper by said waveform stylus.

3,908,642

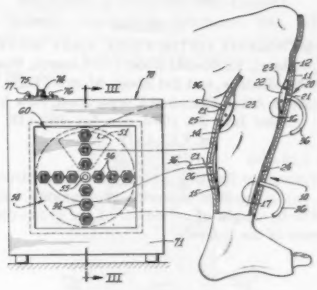
MEANS FOR AERATING AND APPLYING AIR PULSATIONS WITHIN CASTS

Pred Vinmont, 11937 Sunset Blvd., Brentwood, Calif. 90049

Filed Oct. 29, 1973, Ser. No. 410,377
Int. Cl.² A61H *1/00;* **A61F** *15/00*
U.S. Cl. 128—40 **6 Claims**

1. An improvement in means for aerating casts for easing discomfort to a person's body part beneath a cast wherein the cast is provided with opening means for introducing air beneath the cast and delivery means are provided for delivering pressurized air from a source thereof through said opening means, comprising the provisions of:

pulsating means associated with said air delivery means for receiving pressurized air from said source and converting it into periodic pulses of pressurized air to flow in pulses through said opening means and against the body part beneath the cast,



wherein the opening means comprises bladder means locatable under the cast and next to the skin, inflatable to press against the skin and the cast;

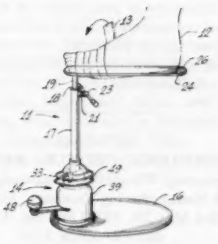
vent means in said bladder means to release air from said bladder means, said vent means releasing air beneath said cast to ventilate the skin beneath the cast.

3,908,643

ADJUSTABLE LIMB SUPPORT

Russell Clark Bliss, 255 E. Orange Grove Ave., Burbank, Calif. 91502

Filed May 13, 1974, Ser. No. 469,402
Int. Cl.² A61F *5/04*
U.S. Cl. 128—83 **1 Claim**



1. In a method for aplying a cast to a patient's limb including the steps of wrapping the limb with a protective underlayer and applying hardenable casting material thereover, the improvement comprising;

supporting at least a portion of said limb on an elongated platform carried by a stand adjacent one end of said platform, said platform having an upper support surface and a lower surface, said platform being connected to said stand at a point on said lower surface adjacent one end of said platform so that said lower surface is unrestricted between the point of connection with said stand and the opposite end of said platform;

placing a layer of protective material about said limb, including placing said protective material about that portion of said limb supported by said platform and about said unrestricted lower surface of said platform, said protective material being provided with an opening adjacent the point of connection of said platform and said stand;

applying a layer of hardenable casting material over said protective material and allowing said casting material to harden; and

removing said platform from between said limb and said cast by withdrawing said elongated platform through said opening in said cast.

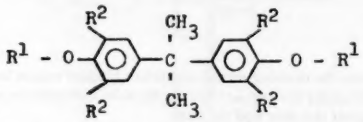
3,908,644

LIGHTWEIGHT ORTHOPEDIC CAST MATERIAL

Louis F. Neinart, Elizabeth; Robert C. Linares, Warren; Paul Jeges, Woodbridge, and Zvi Blank, Morris Plains, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 24, 1974, Ser. No. 482,118
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—90 16 Claims

1. A system for forming a rigid orthopedic structure comprising: (a) a bandage material impregnated with at least about 10% by weight of a member of the group consisting of a monomer of the formula:



wherein R^1 is an acrylic substituent and each R^2 independently is H, CH_2OH or CH_2CH_2OH, a prepolymer of said monomer, and mixtures thereof, and (b) a dual component curing system for said impregnated bandage comprising:

i. a first curing component comprising an organic peroxide and a volatile solvent therefor; and

ii. a second curing component comprising a tertiary amine polymerization promoter.

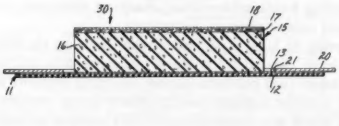
14. A method for constructing orthopedic structures comprising applying to an injured body member a bandage preimpregnated with a monomer or prepolymer or mixtures thereof which is characterized by having active sites capable of further reaction, the monomer or prepolymer or mixtures being curable with a dual component curing system comprising a peroxide and a polymerization promoter and curing the bandage in situ by applying said peroxide and polymerization promoter to the bandage simultaneously.

3,908,645

OPHTHALMIC PRESSURE BANDAGE

Timothy C. Sandvig, Woodville, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 28, 1974, Ser. No. 473,397
Int. Cl.[2] A61F 5/24
U.S. Cl. 128—97 13 Claims



1. An ophthalmic therapeutic pressure bandage comprising:

a. a conformable, permeable carrier tape comprising a backing and a layer of hypoallergenic pressure-sensitive adhesive on one surface thereof;

b. a multi-layer pad attached to said carrier tape on the surface carrying the pressure-sensitive adhesive, said pad comprising:

i. an absorbent resilient foam material adjacent to the tape and attached thereto by the pressure-sensitive adhesive;

ii. an interlayer of absorbent non-woven web material attached to said foam material; and

iii. a porous, non-adherent facing attached to said web material;

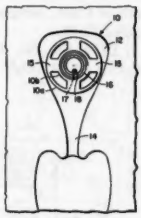
the multi-layer pad being of a shape and size to anatomically conform to the cavity of the external eye and having thickness so as to allow sufficient pressure to be applied to an eye to prevent nictation.

3,908,646

CONCENTRIC LOOP INTRAUTERINE DEVICE

Amir H. Ansari, 2484 Stratford Rd., Cleveland Heights, Ohio 44118

Continuation-in-part of Ser. No. 273,545, July 20, 1972, Pat. No. 3,805,777. This application Mar. 27, 1974, Ser. No. 455,045The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.
Int. Cl.[2] A61F 5/46
U.S. Cl. 128—130 9 Claims



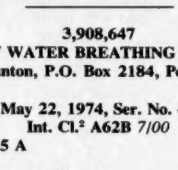
1. An intrauterine device adapted to be inserted in the female uterine cavity comprising a member made of elastic substantially inert material, said member including generally concentric inner and outer rings coupled by a plurality of connector bridges, and means formed of magnetic material carried in said device, said device being capable of deformation for insertion through the cervical canal into said cavity where it regains its original form when released therein and of removal by magnetic coupling with magnetic extractor means, a tab integrally joined at one end thereof to said member and normally coiled therewithin, with said magnetic material being carried by the free end of said tab for extension of the tab and removal of the member by the extractor means.

3,908,647

SHALLOW WATER BREATHING APPARATUS

James Hugh Taunton, P.O. Box 2184, Pompano Beach, Fla. 33060

Filed May 22, 1974, Ser. No. 472,348
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—145 A 4 Claims



1. A breathing tube apparatus means comprising;

a housing with a compartment, said housing having side surfaces, a top surface, and a bottom surface,

said top surface includes a plurality of openings having a diameter of 0.025 inches, plus 0.005 inches or minus

0.010 inches for allowing air to pass into and out of the compartment,

said bottom includes a plurality of openings of substantially larger diameter than the diameter of said top openings for allowing water to pass into and out of the compartment, and

a breathing tube connecting means having an open end projecting into the compartment, said open end being spaced from said top surface and above said bottom surface.

3,908,648

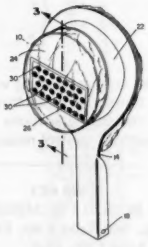
SANITARY FACE MASK

Doris C. McCosker, 9206 Winchester Ave., Margate, N.J. 08402

Continuation-in-part of Ser. No. 210,962, Dec. 22, 1971, Pat. No. 3,740,768. This application Mar. 5, 1973, Ser. No. 338,208

Int. Cl.² A62B 7/10

U.S. Cl. 128—146.6 **6 Claims**



1. A sanitary face mask for use by an individual during spraying, comprising, in combination:

a. mask frame means forming a hollow substantially semi-ovoid with a perimeter suitably contoured for, and adapted to be placed in contact with, a portion of a human face;

b. a separate flexible filter material means removably retained on said mask frame means overlapping the suitably contoured perimeter of said mask frame means;

c. wherein said separate flexible filter material means comprises a composite sheet of material having a filter material portion and a transparent portion;

d. wherein said composite sheet comprises two pieces of material suitably joined to form a pocket for retaining a filter material, said pocket having holes therethrough whereby air can pass through said pocket and said filter material;

e. wherein said separate flexible filter material means is in the form of a bag and is adapted to envelope said mask frame means;

f. wherein manual support means are connected to said mask frame means for supporting said mask frame means manually;

g. wherein retaining means are provided separated from said mask frame means adapted to engage said filter material means to position and retain said filter material means on said mask frame means;

h. wherein said retaining means are complementally configured to said mask frame means and adapted to engage said filter material means in assembled condition with said mask frame means to conform said filter material means to the complementally configured portion of said mask frame means;

i. wherein said retaining means are complementally configured to said manual support means so that said retaining means is manually supported against said manual support means.

3,908,649

PERSONAL FILTER RESPIRATOR

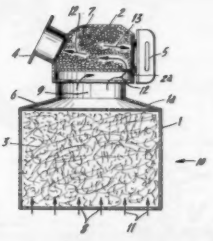
Wolfgang Eckstein, Sereetz, Germany, assignor to Dragerwerk AG, Germany

Filed Dec. 3, 1973, Ser. No. 420,893

Claims priority, application Germany, Dec. 22, 1972, 2262902

Int. Cl.² A61B 7/00

U.S. Cl. 128—147 **2 Claims**



1. A filter respirator for self-protection against carbon monoxide and which has a catalyst portion which operates at high temperatures and a mouthpiece casing portion which is operable to cool respirated air by the evaporation of the user's saliva, comprising a catalyst casing having an air inlet and an internal passage filled with a catalyst material, and a mouthpiece casing connected to said catalyst casing with passage means for a flow of air from the catalyst casing through said mouthpiece casing, said mouthpiece portion casing containing an internal heat exchanger chamber filled with a plastic material of low thermal conductivity through which the inhaled air is passed so that the saliva adheres to the material and the subsequent inhaled air is cooled by the evaporation of the saliva.

3,908,650

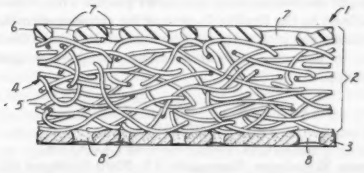
ABRASION AND SOIL RESISTANT MICROPOROUS MEDICAL ADHESIVE TAPE

Wayne Keith Dunshee, Maplewood, Minn., and Clark Edward Vier, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 18, 1974, Ser. No. 480,421

Int. Cl.² A61L 15/00

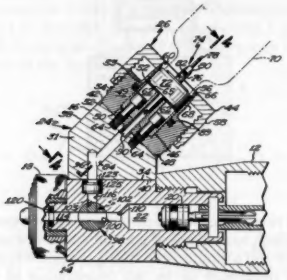
U.S. Cl. 128—156 **10 Claims**



1. An abrasion and soil resistant microporous medical adhesive tape comprising an interlayer comprising a web of intermingled fibers, said interlayer having a porous structure capable of passing perspiration from human skin therethrough; a layer of porous pressure-sensitive adhesive which is nonirritating to human skin on one surface of said interlayer; and a thermoplastic film comprising a thermoplastic which is insoluble in water heat bonded to the other surface of said interlayer, said film being self-sustaining and having about five to 40 pores per square millimeter of film surface, said pores having an average area of no more than about 0.01 square millimeter and constituting about 5 to about 40 percent of the total area of said film; the fibers of said interlayer which are

adjacent to said film being water repellent at least to the extent that water penetrates the fibers with difficulty.

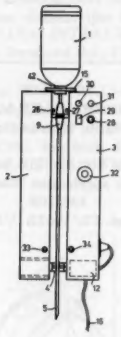
3,908,651
MEDICAMENT INJECTION DEVICE
Robert G. Fudge, Minneapolis, Minn., assignor to Daystrol-Scientific, Inc., Minneapolis, Minn.
Filed May 17, 1974, Ser. No. 470,717
Int. Cl.[2] A61M 5/30
U.S. Cl. 128—173 H 14 Claims



1. Apparatus for providing jet injection of medicament for use in combination with medicament stored in containers comprising, in combination: an injector body; an injector nozzle on one end of the injector body; a medicament chamber within the injector body; first means for selectively changing the volume of the medicament chamber to cause suction of medicament therein and expulsion of medicament therefrom; second means for receiving medicament from a medicament container; a medicament passageway for providing medicament communication between the second means and the injector body; a valve member located within the injector body having a first position for directing medicament from the medicament passageway to the medicament chamber and having second position for directing medicament from the medicament chamber to the injector nozzle; a container holder apparatus including: a retainer member having flexible fingers formed in a closed curve thereon and directed away from the injector body to define a chamber for receiving a portion of the medicament container, third means for mounting the retainer member to the injector body, and fourth means for flexing the fingers inwardly to securely grasp a portion of the medicament container placed within the chamber defined by the flexible fingers of the retainer member; and fifth means for providing air communication from the atmosphere to any medicament container within the container holder apparatus.

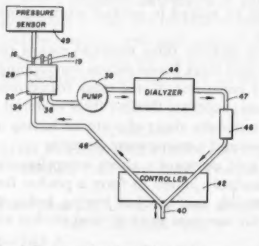
3,908,652
MEDICAL INFUSION APPARATUS
Hermann Weissinger, Fuggerstr. 13, 7000 Stuttgart 80, Germany
Filed Sept. 10, 1973, Ser. No. 395,922
Int. Cl.[2] A61M 05/14
U.S. Cl. 128—214 E 6 Claims

1. Infusion apparatus comprising:
a. a pair of laterally spaced, hollow casing sections having top and bottom ends and defining a space between them,
b. an infusion flask mounting flange at the top end of the casing sections spanning the space between them,
c. an infusion flask mounted on the mounting flange in inverted position,
d. drop sensor means mounted on the casing sections adjacent the top end thereof and operatively spanning the space between the casing sections,
e. a drip chamber communicating with the infusion flask and positioned freely in the space between the casing sections for sensing by the drop sensor means,
f. infusion outfeed control means mounted on the casing sections adjacent the bottom end thereof and operatively spanning the space between the casing sections, and



g. an infusion tube communicating with the drip chamber and extending downward therefrom freely through the space between the casing sections and operatively connected to the outfeed control means.

3,908,653
BLOOD CHAMBER
Donald E. Kettering, Salt Lake City, Utah, assignor to Vital Assists, Inc., Salt Lake City, Utah
Filed Jan. 23, 1974, Ser. No. 435,908
Int. Cl.[2] A61M 01/03
U.S. Cl. 128—214 R 4 Claims



1. A method for monitoring blood in an arterial line of an extracorporeal blood handling system comprising venous and arterial blood lines, a blood pump and a dialyzer, the improvement comprising:
providing a cylindrical blood chamber, the cylindrical configuration minimizing blood stagnation in the chamber;
interposing the chamber in an arterial blood line of an extracorporeal blood handling system upstream of the pump, the chamber having means for maintaining a vertical orientation of the chamber;
passing blood through a variable volume pool of blood in the chamber from a submerged inlet to a submerged outlet while simultaneously minimizing blood foaming by introducing blood into the chamber through the submerged inlet;
inhibiting clot formation in the blood and also enhancing mixing fluids selectively amended to the blood by creating limited subsurface turbulence in the blood, the turbulence being created by introducing the blood into the cylindrical chamber below the blood surface;

maintaining a constant quantity gas cushion above the pool of blood in the chamber; and

communicating pressure developed in the gas cushion by the blood to a pressure sensing device.

3,908,654

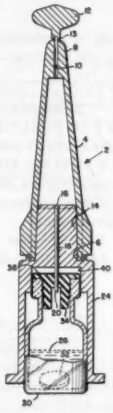
DISPENSING PACKAGE FOR A DRY BIOLOGICAL AND A LIQUID DILUENT

Willy Lhoest, Rixensart, and Eloi Van Hoye, Weert-St-Georges, both of Belgium, assignors to Recherche et Industrie Therapeutiques, Genval, Belgium

Filed Aug. 2, 1974, Ser. No. 493,880

Int. Cl.[2] A61M *05/00*

U.S. Cl. 128—218 M **3 Claims**



1. Dispensing package for a dry biological and a liquid diluent comprising:

a hollow resilient member for containing a liquid diluent open at one end and having a discharge opening at the other end,

removable means closing the discharge opening,

a plug in said one end,

a skirt integral with the plug forming a chamber for the reception of a container,

a hollow needle secured in said plug in communication with the interior of said hollow member and extending into the interior of the skirt,

a container for a dry biological having a pierceable stopper frictionally engaged by said skirt with said needle having its end within the skirt embedded in the pierceable stopper to prevent the flow of liquid through the needle and the stopper spaced away from the plug, whereby further advancing the container into the skirt causes the needle to pass through the pierceable stopper and into the container to permit the transfer of the liquid diluent into the container and then back into the tube for administration through the discharge opening on the removal of the means closing the discharge opening.

3,908,655

POST-OPERATIVE COOLING DEVICE

Helen B. Lund, 14 Houston Rd., Little Falls, N.J. 07424

Filed Sept. 7, 1973, Ser. No. 394,976

Int. Cl.[2] A61F *7/00*; **A61H** *33/06*

U.S. Cl. 128—256 **12 Claims**

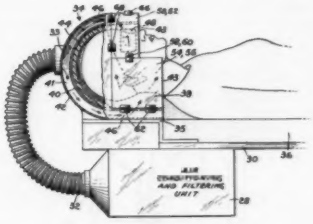
1. A cooling device comprising:

a chamber having a domed wall open at one end and an inlet spaced from said open end, said open end being adapted to receive a portion of a body,

cooling means supplying cold air to said inlet,

a flexible conduit connected between said cooling means and said inlet,

means for distributing said cold air around said domed wall, and



a plurality of hinged compartments extending over the head and facial areas of said body to direct said cold air to selective portions of said head and facial areas.

3,908,656

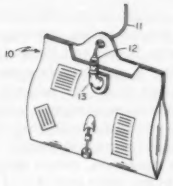
ACTIVATING MEANS FOR VENTED CHAMBERS

William J. Binard, Barrington, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Nov. 23, 1973, Ser. No. 418,227

Int. Cl.[2] F16K *24/00*; **F16L** *55/07*

U.S. Cl. 128—275 **7 Claims**



1. A vented chamber in a body fluid collection bag having an anti-reflux means thereon comprising:

a flexible-walled body fluid collection bag having an opening on an upper portion thereof;

a semirigid chamber disposed on said bag in working relationship with an inlet connector on said bag and with said opening thereon, said semirigid chamber having an anti-reflux means in working relation with said bag and having an opening at both ends thereof, the opening at the uppermost portion thereof having a drip tube extending down into said chamber;

venting means positioned on said chamber at a height that is at least the same as or higher than the lowermost portion of said drip tube extending therein;

an air-trap positioned within said chamber at a location therein above said venting means; and,

means for activating the vented chamber comprising entrapped air within said air-trap for activating said venting means by cutting through any surface adsorption formed thereacross upon any tilting movement of said chamber; and,

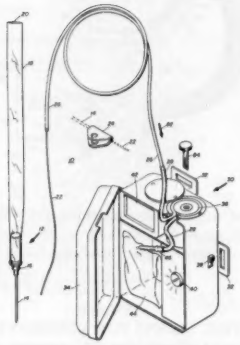
securing means on the lower opened end of said chamber for attaching said chamber to said inlet connector on said body fluid collection bag.

3,908,657

SYSTEM FOR CONTINUOUS WITHDRAWAL OF BLOOD

Avinoam Kowarski, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Jan. 15, 1973, Ser. No. 323,985
Int. Cl.[2] A61B 5/00; A61M 1/00
U.S. Cl. 128—278 10 Claims



1. A system for continuously withdrawing blood from a subject comprising, means having openings only at opposite ends thereof insertable at one end thereof into a vein of the subject for providing a nonthrombogenic passageway for blood being withdrawn from the subject, said passageway having its inner surfaces permanently coated with an anticoagulent substance to preclude clotting of the blood being withdrawn through said means and thereby render the system nonthrombogenic in operation, means externally of the subject and connected to the other end of said nonthrombogenic passageway-providing means for collecting the withdrawn blood, and means engaging only an extra-corporal intermediate section of said nonthrombogenic passageway-providing means for controlling the continuous withdrawing of the blood slowly from the vein at a predetermined constant rate and for a predetermined extended period during which the insertable means is in the vein of the subject.

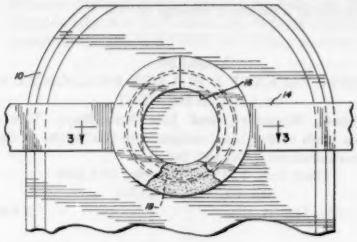
3,908,658

SEAL AND APPLIANCE FOR OSTOMY PATIENTS

Arthur E. Marsan, P.O. Box 3743, Brownsville, Tex. 78520

Continuation-in-part of Ser. No. 255,543, May 22, 1972, Pat. No. 3,799,166, which is a continuation-in-part of Ser. No. 884,842, Dec. 15, 1969, Pat. No. 3,667,469. This application Aug. 15, 1973, Ser. No. 388,491
Int. Cl. A61f 5/44
U.S. Cl. 128—283 7 Claims

1. In an appliance for ostomy conditions and the like, a container for receiving discharged material from a patient's body, the container having a stoma receiving opening through which the stoma discharges into the container, and sealing means adhered to the container around the stoma receiving opening and projecting from the container for adhering to the patient's skin around the stoma, said sealing means being water insoluble and composed essentially of a pressure sensitive adhesion gel body having uniform surface and internal properties of tack, cohesive strength providing elasticity, flexibility, and compressibility and manual kneadability, said



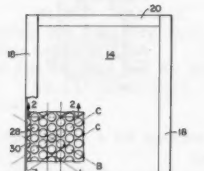
gel consisting essentially of a mixture of mineral oil, styrene-isobutylene copolymer and ethylene-vinyl acetate copolymer.

3,908,659

ABSORBENT PAD STRUCTURE, DIAPER CONSTRUCTION UTILIZING SAME AND METHODS OF MANUFACTURE THEREOF

Bernard Martin Wehrmeyer, Park Hills, Ky., and John Richard Noel, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 14, 1974, Ser. No. 451,312
Int. Cl.[2] A61F 13/16; A61L 15/00
U.S. Cl. 128—287 9 Claims



1. Absorbent pad structure combining high wicking and moisture transport capability with high liquid absorptive capacity to provide high surface dryness impression and high softness impression comprising, in combination,

an air laid pad of generally uniform weight basis consisting essentially of disintegrated cellulose pulp lap contained within a paper tissue envelope defining therewith means for providing structural integrity thereto, together with

means for providing regions having high liquid absorptive capacity spaced apart throughout the pad, and

means for providing enhanced capillary wicking and thereby providing high liquid transport of absorbed moisture within the pad to portions of the pad remote from the point of moisture application, wherein

said means for providing regions of high liquid absorptive capacity comprises a bi-laterally staggered array of spaced apart generally circular tufts formed by undensified regions of relatively low density, and

said means for providing enhanced capillary wicking comprises a bi-laterally extending pattern of intersecting non-linear higher density regions densified essentially only by the application of selective pressures thereto surrounding, separating and extending between each of said low density tufts,

said non-linear densified high density regions comprising between approximately twenty and fifty percent of the area of said pad to thereby enable said staggered array of

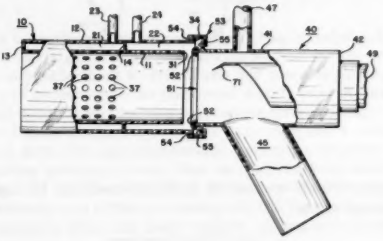
spaced apart generally undensified generally circular tufts and said bi-laterally extending pattern of intersecting non-linear higher density regions together to define means for providing both high dryness impression and high softness impression without substantial stiffening of the pad.

3,908,660

APPARATUS FOR DRAINING A CONDUIT

Isaac Kaplan, c/o Etz Lavud Limited, Shchunat Harakevet, Petah Tikva, Iceland, and Uzi Sharon, c/o Panengineering Ltd., Ramat-Aviv University, Ramat-Aviv,, Israel (P.O.B. 17057)

Filed Jan. 2, 1974, Ser. No. 430,057
Int. Cl.[2] A61B *17/32;* **A61M** *27/00*
U.S. Cl. 128—305 **16 Claims**



1. Apparatus comprising:
a first tube open at first and second ends;
means for holding within said first tube an object having a closed end that is introduced into said tube from said first end;
a second tube open at a first end
means in a second end of said second tube closing off said second end;
means for securing the first and second tubes together so that the first end of the second tube faces the second end of the first tube with a gap therebetween;
means for drawing the sides of the object held in the first tube outwardly of said tube so that when the first and second tubes are secured together the sides of the object may be held between the first end of the second tube and the second end of the first tube to form a seal;
means in said second tube for introducing into the region inside said tube means for opening the object; and
a drain in the second tube.

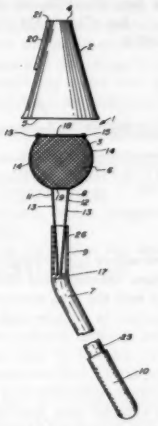
3,908,661

SURGICAL INSTRUMENTS

Steven G. Kramer, 355 Serrano Dr., San Francisco, Calif. 94132

Filed Jan. 31, 1974, Ser. No. 438,211
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—305 **21 Claims**

1. An ophthalmic surgical instrument for use in cataract extraction surgery wherein lens material is removed from an eye through an incision therein, said instrument comprising
a. an elongated sleeve adapted to be inserted into such an incision,
b. means
1. adapted to be inserted through said sleeve into position to encompass such lens material in such an eye when said sleeve is so inserted into said incision, and
2. adapted to be moved outwardly through said sleeve from said eye and adapted to thereby change the form of said lens material encompassed therein to a form which can pass through said incision, and



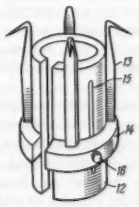
c. means for moving said first mentioned means through said sleeve into and out of said eye when said sleeve is so disposed in said incision.

3,908,662

DEVICE FOR THE EVERSION OF HOLLOW ORGANS AND VASCULAR STAPLING INSTRUMENT INCORPORATING SAME

Mikhail Mikhailovich Razgulov, ulitsa Mashinostroitelei, 32, kv. 80, Podolsk, Moskovskoi oblasti; Lidia Alexandrovna Potekhina, Mosfilmovskaya ulitsa, 27, kv. 27, and Boris Fedorovich Mashinistov, Boitsovaya ulitsa, 13, korpus 1, kv. 5, both of, Moscow, all of U.S.S.R.

Filed July 6, 1973, Ser. No. 376,931
Int. Cl.[2] A61B *17/11*
U.S. Cl. 128—334 R **27 Claims**



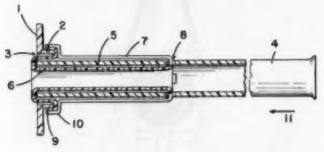
1. A device for the eversion of hollow organs, such as a blood vessel, comprising: a hollow bush member having a peripheral outer surface, the hollow organ end to be everted adapted to be introduced into said bush member; means within said bush member for clamping said hollow organ; spikes adapted to have the edge of said hollow organ end pinned thereto; a base movably secured around the outer surface of the bush member, said spikes arranged about said base along a contour conforming to the outer peripheral surface of said bush member; and means for moving said base, and thereby said spikes, axially along said bush member.

3,908,663

CATHETER

Nicholas F. Viek, Line Rd., R. D. No. 2, Box 115, Malvern, Pa. 19335

Filed Jan. 30, 1974, Ser. No. 437,835
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 R **4 Claims**



1. A catheter structure comprising, in combination, a. a disc having an aperture therein, said disc being adapted to be placed in contact with the area surrounding the urethral meatus with said aperture in registry with the urethra,

b. a thin-walled, flexible, tubular envelope secured to said disc, the forward end of said envelope being disposed within said aperture, said envelope extending rearwardly of said disc and terminating in a plurality of bands, and

c. a semi-rigid catheter tube associated with said envelope, said catheter tube and said envelope having a common axis, the forward end of said catheter tube being inseparably secured to, disposed within and supported by said envelope rearwardly of said disc, said catheter tube having a plurality of apertures corresponding to the number of said bands through which said bands are threaded, said bands extending forwardly over said catheter tube and the ends of said bands are secured to said disc, said apertures in said catheter tube being spaced from the forward end of said catheter tube a distance sufficient to allow the envelope to cover the walls of the urethra and the forward end of said catheter tube within the envelope to enter the bladder,

whereby upon longitudinal movement of said catheter tube toward and into the urethra causes said envelope to unroll progressively to cover the walls of the urethra and upon longitudinal withdrawal of said catheter tube causes said envelope to uncover progressively the walls of the urethra, said envelope being of sufficient length so as to cover the walls of the urethrha before said catheter tube enters the bladder.

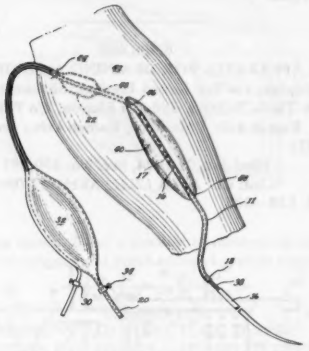
3,908,664

WOUND SUCTION TUBE AND RETROGRADE FLUSHING

Herbert S. Loseff, 308 Woodley Rd., Winnetka, Ill. 60093

Filed Mar. 1, 1974, Ser. No. 447,316
Int. Cl.[2] A61M *27/00*
U.S. Cl. 128—350 R **10 Claims**

1. In a drainage device for wounds and the like, said device comprising an elongated tubular drainage member having a central lumen, and a plurality of drainage ports defined along a first portion of the length of said tubular member and through said tubular member for fluid communication between said lumen and the exterior of said tubular member, the improvement comprising, in combination, an elastomeric retention balloon carried by a second portion of said tubular member located on one side of one end of the first portion, and adapted to be inflatable under the skin of a patient when said first portion is properly positioned in a wound, said tubular member also carrying means for inflating and deflating said retention balloon, a length of severable, imperforate tubing extending from the end of said first portion and having a terminus adapted for screw connection to an awl, said imperforate length of tubing permitting selective connection to an awl without contamination of the drainage ports in said first portion, an enlarged-lumen portion in communication through the central lumen with the drainage ports and for use as a combination squeeze pump and storage portion for retention of a flushing solution therein, and means for selectively sealing said enlarged-lumen portion so that squeezing said



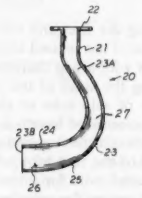
squeeze pump operates to back flush solution through the drainage ports.

3,908,665

ORO-PHARYNGEAL AIRWAY

John A. Moses, 30 Kalan Cir., Fairfield, Conn. 06430

Filed May 20, 1974, Ser. No. 471,485
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—351 **5 Claims**



1. An oro-pharyngeal airway for use in the practice of anesthesiology and resuscitation for insertion into a patient's mouth and pharynx to relieve obstruction to the flow of air that may be occasioned by the base of the tongue falling back in the posterior pharyngeal wall comprising:

a generally straight bite portion having a transversely extending flange at one end thereof,

an extended curved body portion integrally connected to said bite portion, said curved body portion functioning to maintain the patency of a pharynx passageway; said curved body portion having a distal end portion connected to said bite portion and a terminal proximate end portion to define a unitary airway,

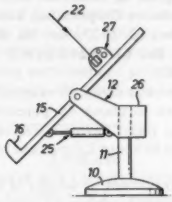
said body portion including spaced apart upper and lower curved walls, and an interconnecting wall for rigidly maintaining the spatial relationship between said upper and lower curved walls,

said curved body portion having a cross-sectional area which progressively increases from said distal end portion to said proximal end portion.

3,908,666
SUN BATH

Raymond Osborne, 50 Lake Dr., Hamsworthy, Poole, Dorset, England

Filed Nov. 14, 1974, Ser. No. 523,752
Int. Cl.[2] A61H 33/06
U.S. Cl. 128—372 9 Claims

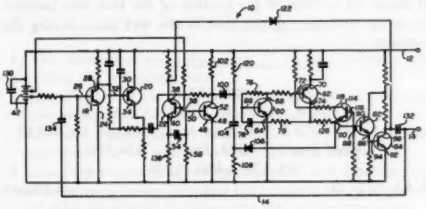


1. A sunbathing platform comprising a base member; a body support member rotatably mounted on the base member so as to be rotatable about a vertical axis and movable to varying angles of inclination to the horizontal; a body support surface on said body support member; a receiving surface on the body support member for receiving the suns rays and a surface spaced from the receiving surface having an aperture for restricting passage of suns rays to the receiving surface, wherein the receiving surface is marked or otherwise delimited whereby rays of the sun passing through the aperture give an indication when the body support surface is in a plane normal to the direction of rays from the sun.

3,908,667
CARDIAC PACER

Robert I. Bernstein, 100 Deerfield Dr., Tenafly, N.J. 07670

Filed Jan. 17, 1973, Ser. No. 324,331
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—419 PG 20 Claims

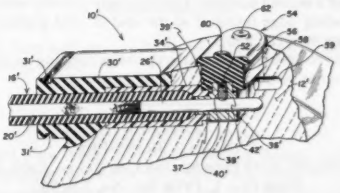


1. A heart pacing apparatus comprising a free-running means for generating a heart simulating electrieal pulse stimulus having a predetermined interpulse period and pulse duration; electrode means comprising means for monitoring the beating action of the heart for detecting the presence of a naturally occuring R-wave and adapted to be positioned relative to the heart for directing said free-running pulse stimulus into the heart for stimulating heartbeat action; coupling means for interconnecting said electrode means and said pulse stimulus generating means; amplifier means operatively connected to said monitoring means for initially amplifying said detected R-wave to provide an initially amplified output signal having a predetermined level therefrom when said R-wave is received; monostable multivibrator means operatively commected to said amplifier means for receiving said initially amplified output signal and generating a single-shot pulse therefrom having a predetermined pulse duration; and means responsive to said single-shot pulse stimulus for inhibiting the generation of said free-running pulse stimulus to said heart until said one present interpulse period after the last naturally occurring detected R-wave, said monostable multivibrator means comprising at least a first transistor means and a second transistor means operatively connected together for generating said single-shot pulse, said first transistor means providing both additional amplification of said detected R-wave in said amplifier means and cooperating with said multivibrator means second transistor means for raising said level of said initially amplified output signal to a predetermined value to cause said multivibrator means to provide said single-shot pulse; whereby said naturally occurring R-wave inhibits the generation of said stimulating pulse and synchronizes the timing of the next succeeding stimulating period.

3,908,668
TISSUE STIMULATOR WITH SEALED LEAD CONNECTOR

Lee R. Bolduc, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 26, 1974, Ser. No. 464,488
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—419 P 15 Claims



1. In combination with a tissue stimulator having pulse generator means for producing tissue stimulation pulses, housing means of a surface material compatible with the human body as an environment enclosing said pulse generator means, lead means adapted to conduct the stimulation pulses to body tissue remote from said pulse generator means upon connection of said lead means to said pulse generator means and lead connector means coupled with said pulse generator means and situated at a predetermined position within said housing means engageable by tool means in the operation of connecting said lead means to said pulse generator means; the improvement comprising:

sealing means of a homogeneous material compatible with the human body as an environment punturable by said tool means to engage said connecter meand and resealable upon removal of said tool means for providing an inert, electrically insulating seal between said connector means and body fluids and tissues, said sealing means being conformed to extend from the surface of said housing means through a gap in said housing means to said predetermined position of said connector means and in contact therewith; and

means associated with said housing means for maintaining said sealing means in fixed contact with said housing means and said connector means.

3,908,669
APPARATUS FOR USE BY PHYSICIANS IN ACUPUNCTURE RESEARCH

Pang L. Man; Calvin H. Chen, both of Northville, Mich., and William T. Donofrio, Toledo, Ohio, assignors to American Acupuncture Medical Instruments, Inc., Toledo, Ohio

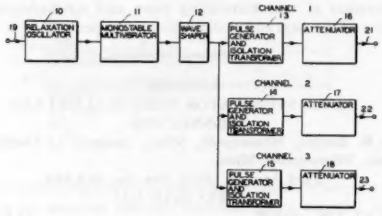
Filed Dec. 17, 1973, Ser. No. 425,695
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—422 23 Claims

1. An apparatus for generating electrical impulses to be applied to acupuncture needles placed in selected portions of the body, comprising:

means for generating a train of trigger pulses;

means for responsive to each of said trigger pulses for generating a control pulse having a pulse width of a predetermined time interval;

means responsive to each of said control pulses for generating an output pulse having a first portion of one polarity with a steep leading edge and a generally rounded crown



initiated at the origin of said predetermined time interval and a second portion of the opposite polarity with a steep leading edge initiated at the end of said predetermined time interval; and

means connecting said output pulse generating means to the acupuncture needles.

3,908,670

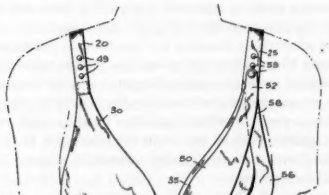
WOMAN'S BRASSIERE

Pauline Dubin, 1250 Palm St., San Luis Obispo, Calif. 93401

Filed Dec. 2, 1974, Ser. No. 528,983

Int. Cl.² A41C *3/02*

U.S. Cl. 128—482 **7 Claims**



1. A woman's brassiere comprising:

a waistband engageable around the body of the wearer;

a pair of shoulder straps adapted to pass over the shoulders of the wearer and to have ends at the front of the wearer spaced above said waistband;

breast enclosing means attached to said waistband and adapted to enclose the breasts of the wearer;

two pair of elongated tapered support strips, each of said support strips having a base end and a tapered end, each pair of support strips being associated with one breast of the wearer;

the base ends of each pair of support strips being attached to said breast enclosing means adjacent to said waistband and spaced laterally from each other;

the tapered ends of each pair of support strips being attached together;

fastener means to connect the tapered ends of each pair of support strips to the end of the associated shoulder strap, whereby the support strips support the breasts of the wearer.

3,908,671

THERMOPLASTIC CIGARETTE WRAPPER

Philip Hancock Cogbill, II, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Dec. 12, 1973, Ser. No. 426,677

Int. Cl.² A24D *01/02*

U.S. Cl. 131—15 R **32 Claims**

1. A thin, microporous cigarette wrapper sheet comprising:

a. about 10 percent to about 45 percent by weight finely divided unfilled flax paper having a size of 140 mesh or less;

b. about 1.5 percent to about 2.8 percent by weight potassium nitrate;

c. up to about 40 percent by weight of a whitener; and

d. about 20 percent to about 55 percent by weight of a thermoplastic binder selected from the group consisting of cellulose esters, cellulose ethers, and mixtures thereof.

3,908,672

NOVEL PROCESS FOR IMPROVING AND MODIFYING THE PROPERTIES OF HAIR

Pierre Bore, Montfermeil; Jean-Claude Arnaud, and Gregoire Kalopisis, both of Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Mar. 8, 1974, Ser. No. 449,432

Claims priority, application Luxemburg, Mar. 8, 1973, 67178

Int. Cl.² A45D *7/00*

U.S. Cl. 132—7 **22 Claims**

1. A process for improving and modifying the properties of living human hair which comprises subjecting the hair to a stretching by mechanical deformation and treating said hair in an aqueous medium with a composition consisting essentially of an alkali or alkaline earth metal hydroxide base and having a pH between about 10.5 and 13 for a time sufficient to convert about 10 to 50% of the cystine of the hair into lanthionine, while maintaining the hair in the wet state during the treatment.

3,908,673

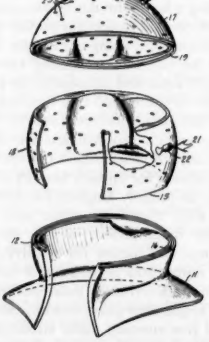
HAIR SHAPING APPARATUS

Uriah H. Carr, 8852 S. Michigan Ave., Chicago, Ill. 60619

Filed Jan. 18, 1974, Ser. No. 434,599

Int. Cl.² A45D *20/00*

U.S. Cl. 132—9 **8 Claims**



1. A hair shaping apparatus for imparting a selected coiffure to the hair of a user, said shaping apparatus comprising:

a substantially rigid structure receivable about the head of a user, having an inner surface in full contact with the hair of the user and in variously spaced relationship from the skin of the head of the user,

said inner hair contacting surface having a contour corresponding to the outer dimensions of a selected coiffure desired to be imparted to the hair of the user,

the structure constructed of a material having a sufficient rigidity to retain the contour of the hair contacting surface during use of the structure,

and a positioning means for holding said structure in a constant relative position atop the head of a user,

said structure being sectionalized permitting said structure to be assembled atop the head of a user.

3,908,674

METHOD OF SECURING HAIR PIECES

Berton J. Kessler, Coventry, R.I., assignor to Cosmeti-Loc Corporation, Providence, R.I.

Filed May 7, 1973, Ser. No. 357,807
Int. Cl.² A41G *3/00*
U.S. Cl. 132—53 **6 Claims**

1. The method of securing a hair piece to a person's scalp comprising the following steps:

A. suturing the scalp with separate sutures at spaced intervals around the periphery of the bald area so that opposite ends of each suture extend outwardly from the scalp and terminate in spaced relation to each other;

B. securing separate fastening means to the free opposite ends of each suture abutting the person's scalp to prevent relative movement between the suture and the scalp;

C. passing the free ends of each suture through aligned openings in the ribbon of the hair piece; and

D. securing readily detachable locking means to the said suture ends.

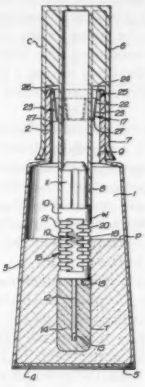
3,908,675

EYESHADOW RECEPTACLE AND APPLICATOR

Walter B. Spatz, Pacific Palisades, and Ronald J. Powers, Manhattan Beach, both of Calif., assignors to Spatz Corporation, Venice, Calif.

Filed June 14, 1974, Ser. No. 479,370
Int. Cl.² A45D *33/00*
U.S. Cl. 132—82 R **14 Claims**

1. A receptacle and applicator for cosmetic powder comprising: a receptacle adapted to contain a quantity of the cosmetic powder, a cap for said receptacle, said cap having a wand, means for mounting said cap in said receptacle with said wand extending into said receptacle and into said cosmetic powder, an applicator tip at the lower end of said wand, and cooperative vibratory means on said receptacle and on said wand responsive to longitudinal withdrawal of said wand from said receptacle to agitate said wand when said cap is



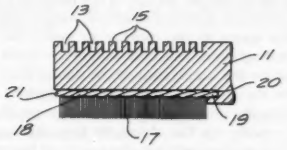
removed from said receptacle as said wand is extracted from said cosmetic powder.

3,908,676

MASCARA APPLICATOR

Sol Levine, New York, N.Y., and Michael Radice, Oakland, N.J., assignors to Revlon, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 408,068, Oct. 19, 1973, abandoned. This application May 22, 1974, Ser. No. 472,345
Int. Cl.² A45D *40/26*
U.S. Cl. 132—88.7 **3 Claims**



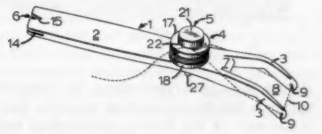
1. A mascara applicator for applying mascara from a container therefor, comprising in combination a rod, a brush portion attached to or integral with said rod in the direction of the axis of the rod and a series of spaced horizontal grooves in said rod substantially opposite the brush portion across the vertical axis.

3,908,677

DENTAL FLOSS HOLDER

Delore A. Beach, 1776 Turquoise Trl., St. Paul, Minn. 55122

Filed Dec. 12, 1974, Ser. No. 531,980
Int. Cl.² A61C *15/00*
U.S. Cl. 132—91 **2 Claims**



1. A dental floss holder for use in dispensing and supporting a strand of dental floss under tension for cleaning the teeth, comprising the combination of the following elements:

a body, being a flat elongate handle with a pair of equal forked prongs projecting longitudinally from one end thereof, with eyelets through the ends of the prongs for threading the strand of dental floss therethrough, the body having a cylindrical mounting hole therethrough at right angles to the plane of the handle and prongs, the location of the mounting hole being nearby the juncture of the prongs, the body having a mortise recessed in the upper surface thereof, the mortise being centered on the mounting hole;

a spool, having a cylindrical barrel with equal circular end flanges, to carry a supply of dental floss wound thereon, the spool having a cylindrical axial hole, one flange having a tenon projecting from the outer circular face thereof, the tenon centered on the axial hole and having dimensions to fit receivably into the mortise of the body, with the axial hole aligned with the mounting hole and the tenon inserted in the mortise;

a catch pin, for removable attachment of the spool to the body, the catch pin having a cylindrical shank of diameter to frictionally fit through both the axial hole of the spool and the mounting hole of the body when the spool is supermounted upon the body, the catch pin having a head at one end to limit the position of the spool, the head having a blunt conical surface adjacent to the plane surface of the spool flange, affording between the head and and the spool a post for tethering the free end of the dental floss, the shank being of a length to protrude substantially beyond the lower surface of the body when fully inserted for attachment of the spool to the body, the point of the catch pin being split longitudinally into two equal legs, the legs being sprung apart to cause them to tend to expand in the mounting hole, the length of shank standing in the lower half of the mounting hole being necked down to the level of the rim of the mounting hole to afford latch shoulders;

wherein full insertion of the catch pin through the spool and body results in expansion of the legs and catching of the latch shoulders on the rim of the mounting hole, securing the catch pin against extraction, maintaining the position of the tenon in the mortise to make the spool secure against rotation, and establishing the spool as an anchor point for the supply end of the dental floss; and

wherein the catch pin may be unlatched by pinching and pushing the point into the mounting hole, the spool lifting concertedly on the shank to free the tenon from the mortise and permitting the spool to be rotated on the shank when the free end of the dental floss is pulled, to reel off a length of fresh dental floss.

3,908,678

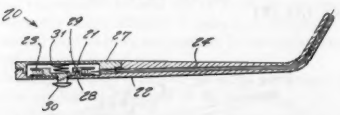
FLOSS PIC

Jay B. Conn, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Apr. 15, 1974, Ser. No. 460,774

Int. Cl.[2] A61C *15/00*

U.S. Cl. 132—92 A **3 Claims**



1. a dental floss pick comprising an elongated tapered holder having a handle end and an opposite forked end inclined to the axis of the holder, said forked end including spaced symmetrical tines for retaining floss therebetween in a taught operative condition, one of said tines including a peripheral slot for securing a portion of said floss and the other tine having means for receiving and engaging another portion of the floss spaced from the first said portion, including additional means for securing an end of the floss, whereby said slot is parallel to said floss.

3,908,679

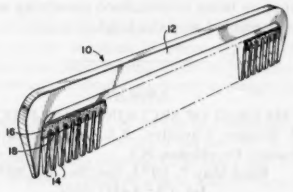
HAIR CONDITIONING DEVICE

Hershel Earl Wright, 12 Eighth Dr., Decatur, Ill. 62521

Filed Oct. 23, 1973, Ser. No. 408,281

Int. Cl.[2] A45D *24/22*

U.S. Cl. 132—116 **4 Claims**



1. A hair conditioning device which comprises, in combination, a supporting member and a plurality of generally depending elements secured to said supporting member, said elements being spaced one from the other and having conditioning material solidified between said depending elements and occupying at least a portion of the space between the supporting member and a plane perpendicularly oriented with respect to the depending elements located between said member and the ends of said depending elements, said conditioning material being sufficiently solid to retain its shape under atmospheric pressure between the temperatures of about 50° to about 90°F. and being sufficiently fluidized after a short period of contact with water to be capable of uniformly applying conditioning material to hair shafts when said device is used.

3,908,680

METHODS FOR CLEANING AND BLEACHING PLASTIC ARTICLES

Joseph Z. Krezanoski, Los Altos, Calif., assignor to Flow Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Oct. 12, 1973, Ser. No. 405,751

Int. Cl.[2] B08B *3/10*

U.S. Cl. 134—27 **24 Claims**

1. A method of cleaning plastics wherein said plastics are suitable for use in hard and soft lenses comprising:

a. successively contacting the plastic with a first aqueous solution and then a second aqueous solution, with each solution containing an active oxygen yielding per cōm-pound in a concentration of 0.1 – 15% by weight and one of said solutions being acidic and the other of said solutions being basic; and

b. removing the plastic from the second solution, contacting it with a non-ionic detergent, and rinsing it with water.

3,908,681

FORCED AIR CIRCULATION SYSTEM FOR A DISHWASHER

Thomas O. Schimke, Fern Creek, and Donald S. Cushing, Louisville, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Nov. 9, 1973, Ser. No. 414,383

Int. Cl.[2] B08B *3/04*

U.S. Cl. 134—94 **6 Claims**

1. A dishwasher comprising:

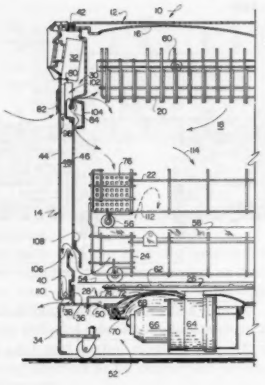
a tub and a movable door defining therebetween a wash chamber, the door having inner and outer panels defining therebetween a compartment;

an article receiving rack and means mounting the rack for movement into and at least partially out of the wash chamber;

means for spraying washing liquid toward the rack;

a heat source for heating air passing through the wash chamber during a drying portion of the operating cycle; and

means for diverting air both upwardly and downwardly in the wash chamber during the drying portion of the cycle including



a fan, in the compartment, having an inlet opening to the exterior of the dishwasher and an outlet opening through the inner door panel into the wash chamber at a first elevation;

a motor drivably connected to the fan and nested within the confines of the fan to cause air entering the inlet opening to pass over said motor in heat exchange relationship thereto; and

means for exhausting air from the wash chamber at a second elevation below the first elevation.

3,908,682

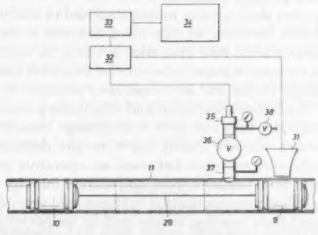
METHODS AND APPARATUSES FOR REMOTELY AND RELEASABLY SEALING A PIPE LINE

Albert L. Thompson, Houston, Tex., assignor to Texas Pipe Line Company, Houston, Tex.

Continuation of Ser. No. 253,386, May 15, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,777

Int. Cl.² F16L *55/12, 55/18*

U.S. Cl. 137—15 **16 Claims**



1. In a pipe of moving fluid, a method for sealing off a section of pipe having an upstream terminus and a downstream terminus comprising the steps of,

a. positioning an ultrasonic generator at one of the termini of the pipe section,

b. positioning an ultrasonic receiver on each of an upstream pipe internal sealing means and a downstream pipe internal sealing means for actuation by the ultrasonic generator means,

c. transporting both the upstream and downstream pipe internal sealing means in the moving fluid of the pipe toward the upstream and downstream termini, and

d. sealing the pipe at each of the upstream terminus and the downstream terminus simultaneously as each of the ultrasonic receivers arrives at its respective terminus simultaneously.

3,908,683

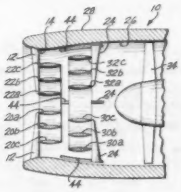
TRANSLATING MULTI-RING INLET FOR GAS TURBINE ENGINES

Roy W. Demetrick, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 3, 1974, Ser. No. 475,534

Int. Cl.² F02K *3/00*

U.S. Cl. 137—/15.1 **14 Claims**



1. An inlet for gas turbine engine with air flow through the inlet controlled by a variable geometry apparatus comprising: a first set of concentric rings positioned across an opening to the inlet, a second set of concentric rings located to translate axially into and out of interjacent position with the first set of concentric rings to present a reduced area for air flow when in interjacent position and to present an enlarged area for air flow when moved out of the interjacent position, means for translating the second set of concentric rings, and the distance between concentric rings in each set increase with the distance from the axis.

3,908,684

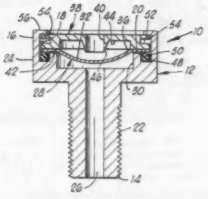
RUPTURE DISK ASSEMBLY

Edward H. Short, Tulsa, Okla., assignor to Black, Sivalls & Bryson, Inc., Houston, Tex.

Filed Nov. 4, 1974, Ser. No. 520,405

Int. Cl.² F16K *17/40*

U.S. Cl. 137—68 **14 Claims**



1. A rupture disk assembly comprising:

a substantially cylindrical hollow housing having an inlet end and an outlet end and including an annular shoulder within the interior thereof facing the outlet end thereof; a circular reverse buckling rupture disk positioned within said housing, the outer annular portion of said rupture disk lying adjacent and being supported on said annular shoulder of said housing;

an annular supporting member adapted to fit within said housing adjacent said rupture disk including an annular surface to coact with said annular shoulder in said housing and support the annular outer portion of said rupture

disk therebetween, said supporting member including an annular lip portion extending outwardly around the periphery thereof; and

the outlet end of said housing being folded over said outwardly extending lip portion of said supporting member so that said lip portion is deformed towards the inlet end of said housing and said supporting member and said rupture disk are rigidly clamped against said shoulder within said housing.

3,908,685

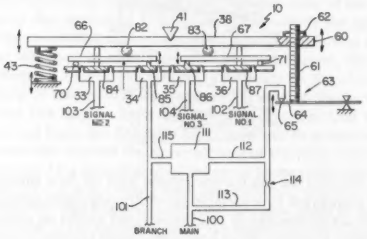
PNEUMATICALLY OPERATED CONTROL DEVICE AND PARTS THEREFOR OR THE LIKE

Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 10, 1973, Ser. No. 405,093

Int. Cl.² F15B *5/00;* **G05D** *16/00*

U.S. Cl. 137—84 **16 Claims**



11. A control device having a first movable lever and a control means controlled by the movement of said first lever, a flexible diaphragm carried by said control device and having U-shaped means engaging said first lever to tend to cause movement of said lever upon movement of said diaphragm, and a second movable lever carried by said control device and disposed intermediate said diaphragm and said first lever to act on said first lever, said U-shaped means of said diaphragm being straddled by said second lever so that movement of said diaphragm will not cause movement of said second lever.

3,908,686

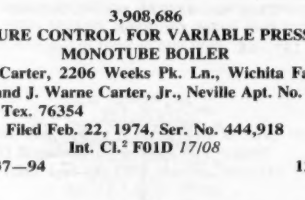
PRESSURE CONTROL FOR VARIABLE PRESSURE MONOTUBE BOILER

J. Warne Carter, 2206 Weeks Pk. Ln., Wichita Falls, Tex. 76308, and J. Warne Carter, Jr., Neville Apt. No. 8, Burkburnett, Tex. 76354

Filed Feb. 22, 1974, Ser. No. 444,918

Int. Cl.² F01D *17/08*

U.S. Cl. 137—94 **12 Claims**



1. In combination, a variable pressure steam boiler, combustion fuel control valve means connected to the boiler to supply a controlled rate of combustible fuel thereto, variable control throttle valve means having different power settings connected to the output of the boiler to control the pressure on a utilizing device supplied by the boiler, pressure differential-sensing means connected across said throttle valve means, and means operatively coupling said pressure differential-sensing means to said fuel control valve means.

3,908,687

MARINE STEERING CONTROL VALVE AND SYSTEM

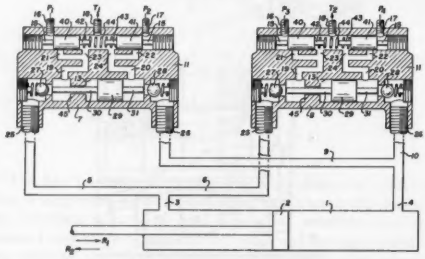
Robert Arthur Ray Wood, Vancouver, Canada, assignor to Teleflex Incorporated, North Wales, Pa.

Filed June 18, 1974, Ser. No. 480,480

Claims priority, application United Kingdom, June 18, 1973, 28841/73

Int. Cl.² F15B *13/04*

U.S. Cl. 137—106 **10 Claims**



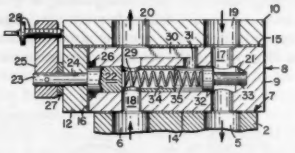
1. A hydraulic control valve assembly comprising; a valve body having first and second inlets and first and second outlets, said valve body having first fluid passage means extending between said first inlet and said first outlet and second fluid passage means extending between said second inlet and said second outlet, said valve body having a return outlet and fluid return passage means extending between said first and second fluid passage means and said return outlet, first check valve means in said first fluid passage means adjacent said first outlet and having a seated position for checking reverse fluid flow through said first fluid passage means toward said first inlet and movable to an unseated position for allowing fluid flow therepast, second check valve means in said second fluid passage means adjacent said second outlet and having a seated position for checking reverse fluid flow through said second fluid passage means toward said second outlet and movable to an unseated position for allowing fluid flow therepast, unseating means in said valve body for unseating each of said respective said check valves in response to a predetermined pressure in the fluid passage means in which the other check valve is disposed, first shuttle valve means disposed in said valve body and movable between an operative position in response to fluid pressure from said first inlet opening for establishing a first fluid communication between said first inlet and said first fluid passage means and an inoperative position for blocking said first fluid communication and establishing a second fluid communication between said first passage means and said return outlet, second shuttle valve means disposed in said valve body and movable between an operative position in response to fluid pressure from said second inlet for establishing a third fluid communication between said second inlet and said second fluid passage means and an inoperative position for blocking said third fluid communication and establishing a fourth fluid communication between said second passage means and said return outlet, and biasing means urging said first and second shuttle valve means toward said inoperative positions to move each of said shuttle valve means to said inoperative positions when said pressure from said inlets is less than said opening pressure to equalize the fluid pressures in said first and second fluid passage means for moving said unseating means to an inoperative position where both of said check valve means are in their respective seated positions.

3,908,688

SPEED ADJUSTMENT CONTROL FOR A FLUID MOTOR

Ebenhard S. Gandrud, P.O. Box 528, Owatonna, Minn. 55060

Filed June 8, 1973, Ser. No. 368,210
Int. Cl.² F15B 13/042; G05D 7/00, 16/00
U.S. Cl. 137—110 3 Claims



1. A speed adjustment control device for fluid motors, said device comprising:

a. a valve body defining laterally spaced inlet and outlet passages adapted to be connected at one end to high pressure inlet and low pressure outlet openings respectively of a fluid pressure operated motor;

b. said body defining inlet and outlet ports to the other ends of said inlet and outlet passages respectively, said inlet port being adapted to be connected to a source of fluid under pressure;

c. a cylindrical recess in said body intersecting said inlet and outlet passages intermediate the ends of said passages;

d. a cylindrical metering valve element rotatively mounted in said recess coaxially therewith and having a transverse opening therethrough movable circumferentially into and out of register with said outlet passage to variably restrict flow of fluid through said outlet passage responsive to rotation of the metering valve element, said metering valve element having an inner end disposed between said inlet and outlet passages;

e. means for imparting rotary movement to said metering valve element;

f. said body further defining shunt passage means communicating at one end with said inlet passage and at its other end with said outlet passage intermediate said metering valve element and said outlet port, said shunt passage means including a portion of said recess between said inner end of the metering valve element and said inlet passage;

g. a shunt valve element disposed in said recess portion of the shunt passage for movements axially of said recess portion between valve closed and various valve open positions in said shunt passage means to control shunt flow of fluid therethrough;

h. said metering valve element defining an axial pocket connected to said transverse opening and opening toward said shunt valve element;

i. and a compression spring having one end disposed in said pocket and an opposite end engaging said shunt valve element and yieldingly urging said shunt valve element toward said valve closed position thereof.

3,908,689

FREE FLOW SIPHON PUMP AND ASSEMBLY

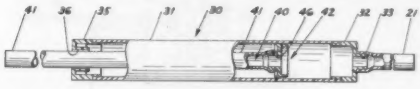
Glen R. Wingate, 810 Blue Ridge Parkway, Longview, Tex. 75601

Filed Sept. 7, 1973, Ser. No. 395,139
Int. Cl.² H01M 2/14
U.S. Cl. 137—149 6 Claims

1. A pump for a siphon comprising

a pump housing comprising an elongated cylindrical sleeve, fabricated from plastic tubing and provided with an interior coating of a tetrafluroethylene; an inlet end cap cemented to said sleeve in sealing relation, having an inlet hose nipple with an opening of a diameter smaller than that of said sleeve; a discharge end bushing cemented to said sleeve, having a central guide opening of a diameter smaller than that of said sleeve;

a pump actuator comprising an elongated tubular conduit and a piston fixed to one end thereof; said conduit being dimensioned to pass through said end bushing opening and being substantially longer than said housing; said piston being a unitary member molded from a resilient plastic material, having a peripheral cylindrical surface dimensioned for a sliding fit with said housing sleeve interior wall, and having a peripheral axial flange diverging outwardly from said cylindrical surface; said piston



flange being flexible and having a normal maximum exterior diameter slightly larger than the interior diameter of said sleeve; said piston having a central opening of a diameter smaller than that of said sleeve, and having means for securing said actuator conduit to said piston in sealing relation with said piston opening;

said actuator conduit defining the discharge conduit for said pump and said sleeve, said inlet end cap and said piston defining a pumping chamber;

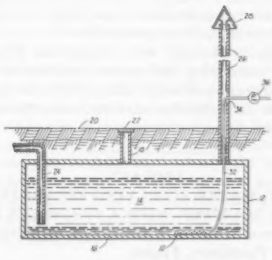
said bushing opening having a diameter slightly larger than that of said actuator conduit defining a vent for the chamber defined by said sleeve, said bushing and said pump actuator.

3,908,690

DEVICE FOR REMOVING WATER FROM THE BOTTOM OF EXISTING UNDERGROUND LIQUID FUEL TANKS

Albert Shotmeyer, 46 Waverly Rd., Saddle River, N.J. 07458

Division of Ser. No. 396,576, Sept. 12, 1973. This application Oct. 7, 1974, Ser. No. 512,868
Int. Cl.² F16T 1/00
U.S. Cl. 137—172 9 Claims

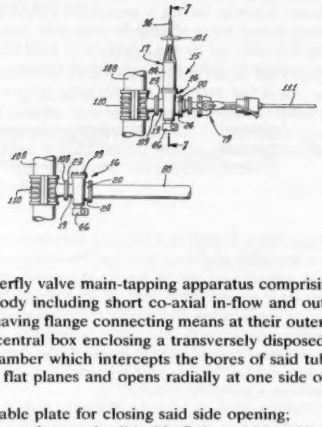


1. In combination with an underground liquid fuel tank having an upstanding vent pipe and an opening in a side wall of said vent pipe; a device for removing water from the bottom of said tank including a flexible walled hollow container made from an easily crumpable material having at least one perforation through an outside bottom wall thereof, said device having a specific gravity greater than that of the liquid fuel and water in the tank whereby said device sinks in the liquid in the tank and rests on the bottom of the tank when immersed therein with the perforation at substantially the lowest point in the tank; a tubular conduit connected at one end with the container and the other end extending into said vent pipe and through said opening therein; and a suction means attached to the said outer end of said tubular conduit.

3,908,691
BUTTERFLY VALVE MAIN-TAPPING APPARATUS

Donald W. Coughlin, P.O. Box 535, Lake Arrowhead, Calif. 92352

Filed Sept. 19, 1974, Ser. No. 507,405
Int. Cl.[2] F16L 55/18
U.S. Cl. 137—315 8 Claims



1. A butterfly valve main-tapping apparatus comprising:
a valve body including short co-axial in-flow and out-flow tubes having flange connecting means at their outer ends and a central box enclosing a transversely disposed slot-like chamber which intercepts the bores of said tubes in spaced flat planes and opens radially at one side of said box;
a removeable plate for closing said side opening;
an annular wafer snugly slideably fitting within said chamber when inserted through said box side opening and having a bore connecting said tube bores;
a butterfly disc fitting snugly within said wafer bore and pivotally mounted on diametrally aligned trunnions A and B which journal in bearings provided in said wafer, the bearing for trunnion A forming a radial neck on said wafer which terminates within said cover plate for the said opening of said chamber;
means adapted to replace said cover plate to provide a water tight radial extension of said chamber;
means operating radially through said chamber extension means to engage said wafer neck and withdraw said wafer from its normal position of intercepting said tube bores, said means, when reversed, operating to replace said wafer in said normal position; and
means operating through one of said disc trunnions for manually controlling the pivotal rotation of said disc about said trunnions when said wafer is in said normal position in said chamber and enclosed therein by said cover plate.

3,908,692
AUTOMATIC WATER SUPPLYING APPARATUS FOR A VEHICLE EQUIPPED WITH A SPRINKLER BANK

Maurice Laureau, 7, Rue du Lieutenant Boulay Pringy, 77310 St. Fargeau Ponthierry, France

Filed Jan. 24, 1974, Ser. No. 436,092
Claims priority, application France, Jan. 24, 1973, 73.02528
Int. Cl.[2] A01G 25/02; B05B 15/06
U.S. Cl. 137—355.16 7 Claims

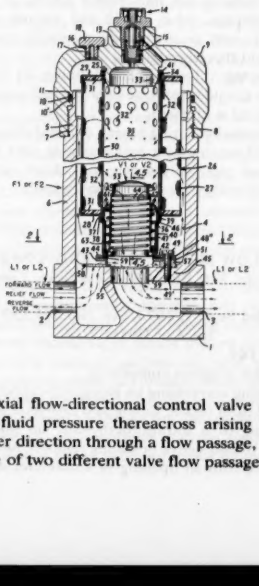
1. A water supply apparatus for a vehicle carrying sprinkling equipment comprising:
a. stationary facility located on the ground and including a line of pipes having from place to place a water outlet, and a spring valve for opening and closing each water outlet; and
b. a movable facility borne by the vehicle and including two water taps which are alternately releasably connected to said outlets, a pair of carts, each of which bears one of said taps and is movable with respect to the vehicle, guide means, provided on said vehicle, for supporting and guiding said two carts as to lengthwise motion of said two carts with respect to the vehicle, said supporting and guiding means including two separate ways on which said carts are supported and guided, a common pipe collector secured to said supporting and guiding means, two flexible hoses each linking one of said carts to said common pipe collector, a pulley rotatably mounted at a front end of said supporting and guiding means, a return cable connecting both said carts and passing over said pulley, said return cable and said pulley ensuring return passage from rear to front of the vehicle of one tap that is disconnected from one outlet because of relative motion of the

vehicle and the other tap which is connected to another outlet, movable connecting means, linking each tap to a corresponding cart, for ensuring lateral or vertical release of said one tap, which is disconnected and returns to the front of the vehicle, with respect to said other tap connected to said another outlet when said one and said other taps cross each other, and hydraulically actuated means, borne by both said taps, for automatically securing connection of said one tap disconnected from said one outlet to said another outlet to which said one tap is to be connected and simultaneously releasing said other tap connected to said another outlet.

3,908,693
COAXIAL BIDIRECTIONAL FLOW CONTROL AND RELIEF VALVES AND HYDROSTAT SYSTEM CONTAINING THE SAME

Roydon B. Cooper, Locust Valley, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed May 1, 1973, Ser. No. 356,231
Int. Cl.[2] F16K 17/04
U.S. Cl. 137—493 29 Claims



1. A coaxial flow-directional control valve responsive to differential fluid pressure thereacross arising from flow of fluid in either direction through a flow passage, to direct flow through one of two different valve flow passages and thereby

provide a bypass flow function, comprising, in combination, a tubular valve housing; first and second valve seats in the housing; first and second coaxial tubular valve elements nested concentrically and separately reciprocable within the valve housing towards and away from the first and second valve seats, respectively, between closed and open positions, to close and open first and second valve flow passages, respectively, of which one provides a bypass function; a fluid-pressure receiving surface operatively connected to each valve element, urging the first valve element in a first direction towards or away from its valve seat, and the second valve element in a second direction, towards or away from its valve seat; bias means urging each valve element in the opposite direction, the biasing force of the bias means being adjusted to resist movement of each valve element in said direction away from or towards its valve seat except under differential fluid pressure arising from flow and applied to the fluid pressure receiving surface from the first or second flow direction, and each of the valve elements moving in said direction towards or away from its valve seat and opening when flow begins from that direction and closing when flow stops from that direction, the first valve element being responsive to differential fluid pressure arising from flow in the first direction from one side of the valve, and the second valve element being responsive to differential fluid pressure arising from flow in the second direction from the other side of the valve, so that the valve is arranged to open or close in response to differential fluid pressure arising and applied from either direction of flow, and to direct such flow through one of the first and second valve flow passages according to flow direction.

3,908,694

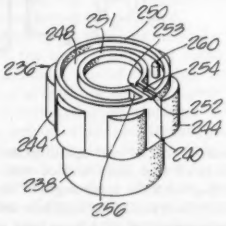
EMITTER VALVE FOR SUBTERRANEAN IRRIGATION SYSTEMS

Wayne Spears, 2840 N. Naomi, Burbank, Calif. 91504

Filed Aug. 2, 1973, Ser. No. 385,084

Int. Cl.[2] B05B *1/30;* **F16K** *15/14*

U.S. Cl. 137—513.3 **12 Claims**



1. An improved emitter valve for subterranean irrigation systems and the like comprising:

a valve casing having an inlet opening, an outlet opening and a valve chamber between said inlet and outlet openings;

means defining a valve seat around said outlet opening of said valve casing;

a valve member disposed in said valve chamber;

said valve member having an outer surface facing said outlet opening of said valve casing; said outer surface being formed of a resilient material; said outer surface having a center portion in substantial alignment with said outlet opening of said valve casing and an upstanding outer peripheral portion in substantial alignment with said valve seat around said outlet opening; said upstanding outer peripheral portion of said resilient outer surface being adapted to engage said valve seat around said outlet opening when fluid under pressure is introduced through said inlet opening and into said valve chamber at a pressure greater than a predetermined pressure;

means defining a radial fluid passage in said outer surface of said valve member; said radial passage extending from a point within said central portion of said outer surface and through said upstanding outer peripheral portion of said outer surface.

3,908,695

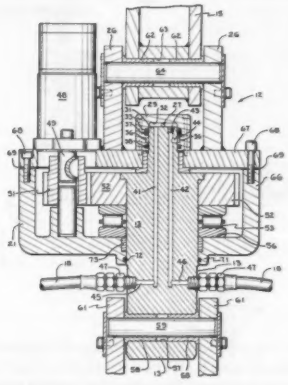
HYDRAULIC ROTATOR MECHANISM

Glenn G. Dunbar, 2608 Overbrook Dr., Toledo, Ohio 43614

Filed Dec. 28, 1973, Ser. No. 429,118

Int. Cl.[2] F16K *39/00*

U.S. Cl. 137—580 **8 Claims**



1. A hydraulic rotator mechanism for use on hydraulic equipment wherein a hydraulically operated implement is rotatable with respect to a support member, comprising, a housing having brackets for connection to such support member, said housing having upper and lower bores defined therethrough, a hydraulic fluid cap connected to said housing adjacent one of said bores, said cap having fluid connectors for receiving hydraulic fluid lines extending from such support members and connected to a hydraulic fluid source, said cap defining a cylindrical bore axially aligned with said bores in said housing, a rotatable output shaft positioned within said bores of said housing and said bore of said cap, said shaft including a plurality of longitudinal passageways and a plurality of transverse fluid ducts rotatable with said output shaft near the lower end of said shaft establishing communication between said longitudinal passageways and lower fluid lines leading to such hydraulically operated implement, whereby said rotatable output shaft, such lower fluid lines and such implement rotate together without twisting of such fluid lines, and means within said fluid cap for establishing fluid communication between each upper fluid line and a corresponding longitudinal passageway.

3,908,696

METERING OF TRACE AMOUNTS OF FLUIDS FOR PRODUCING LOW CONCENTRATIONS THEREOF IN CARRIER FLUIDS

Heinrich Hartkamp, Heiligenhaus, and Gerhard Nitz, Mulheim, Ruhr, both of Germany, assignors to Landesanstalt fur Immissions und Bodennutzungsschutz des Landes Nordrhein-Westfalen, Essen, Germany

Filed Nov. 11, 1974, Ser. No. 522,351

Claims priority, application Germany, Nov. 9, 1973, 7340140[U]

Int. Cl.[2] F16K *19/00*

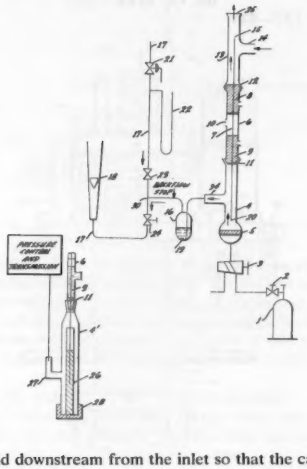
U.S. Cl. 137—604 **9 Claims**

1. Metering device for obtaining low concentration of a particular fluid in a carrier fluid, comprising:

a first tube connected to receive the particular fluid;

a second tube having a lateral inlet for connection to receive the carrier fluid, further having an outlet, carrier fluid flowing from the lateral inlet to the outlet;

a capillary duct having entrance and exit openings and extending from the interior of the first tube to the interior of the second tube, the entrance opening being located in the first tube, the exit opening being located in the second



tube and downstream from the inlet so that the capillary duct discharges into the second tube downstream from the inlet thereof, the capillary duct providing the only fluid connection between the first and second tubes; and means including a source for constant and regulated auxiliary pressure and pressure - conductively connected to the interior of the first tube for obtaining a particular and regulated fluid pressure at the entrance opening of the capillary duct.

3,908,697

ROTARY FLUID VALVE

Hans G. Witzel, Berlin, Conn., assignor to Polymer Machinery Corporation, Berlin, Conn.

Filed Oct. 30, 1973, Ser. No. 411,171

Int. Cl.[2] F16K *11/083, 25/00*

U.S. Cl. 137—625.47 **12 Claims**

1. A fluid valve comprising in combination:

a vertically oriented housing having a conically tapered through bore which narrows in a downward direction and a pair of diametrally opposed openings;

a frusto-conical movable valve member normally seated within said bore by its own weight, said movable valve member including two spaced parallel solid discs extending transverse to the longitudinal axis of said bore, and a solid web member interconnecting said discs and extending along an entire diameter of each of said discs, the longitudinal spacing between said discs being greater than the longitudinal size of said openings and the peripheral edge surfaces of said discs and of said web lying on a conical surface with the same angle of taper as said bore, whereby when said surface of said movable valve member engages the surface of said bore said openings will be situated between said discs;

an axial shaft connected to and extending from the lower surface of said movable valve member;

means, including a radial bearing for said shaft, for mounting said movable valve member within said housing so that it is rotatable about said axis and movable along said axis, said means for mounting further including a support plate for said housing connected across the lower open end of said housing, said plate having an opening which is along said longitudinal axis of said bore and through which said shaft passes;

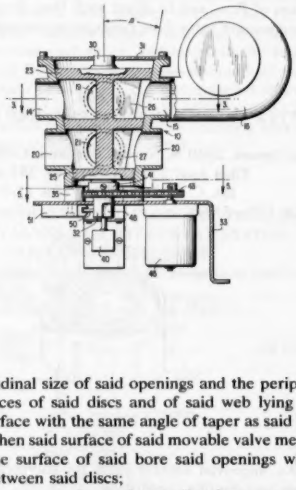
first energizable means connected to said support plate and positioned below the end of said axial shaft for raising said movable valve member along said longitudinal axis when energized to unseat said movable valve member; and,

second means, including energizable drive means mounted on said support plate and means for flexibly connecting said drive means to said axial shaft, for rotating said movable valve member about said longitudinal axis when said drive means is energized.

6. A fluid valve comprising in combination:

a vertically oriented housing having a conically tapered through bore which narrows in a downward direction and a pair of diametrally opposed openings;

a frusto-conical movable valve member normally seated within said bore by its own weight, said movable valve member including two spaced parallel solid discs extending transverse to the longitudinal axis of said bore, and a solid web member interconnecting said discs and extending along an entire diameter of each of said discs, the longitudinal spacing between said discs being greater than



the longitudinal size of said openings and the peripheral edge surfaces of said discs and of said web lying on a conical surface with the same angle of taper as said bore, whereby when said surface of said movable valve member engages the surface of said bore said openings will be situated between said discs;

an axial shaft connected to and extending from one of said discs;

means, including a radial bearing for said shaft, for mounting said movable valve member within said housing so that it is rotatable about said axis and movable along said axis;

first energizable means cooperating with said shaft for raising said movable valve member along said longitudinal axis when energized to unseat said movable valve member;

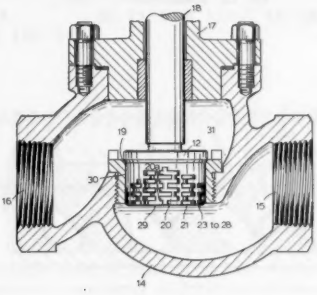
second energizable means cooperating with said shaft for rotating said movable valve member about said longitudinal axis when energized; and

means for limiting the angle of rotation of said movable valve means including a plurality of cam surfaces formed on said shaft, and electrical switch means cooperating with and controlled by said cam surfaces, said electrical switch means being electrically connected in series with each of said first and second energizable means for controlling the energization thereof.

3,908,698
VARIABLE RESISTANCE TYPE THROTTLING TRIM

Hans D. Baumann, 29 Villa Dr., Foxboro, Mass. 02035

Filed Mar. 7, 1974, Ser. No. 444,020
Int. Cl.² F16K *47/04*
U.S. Cl. 137—625.3 **4 Claims**



1. A variable resistance type valve throttling element comprising:

a. a seatring having a cylindrical bore of constant diameter throughtout its entire length, therein providing inner wall surfaces, and having an upper and a lower terminating portion; the upper terminating portion of said seatring providing sealing means;

b. a cylindrical valve plug slidingly engaged within the cylindrical bore of said seatring and having an upper terminating portion, the upper terminating portion of the cylindrical plug having a slightly enlarged rim portion to provide sealing means able to cooperatively engage with the sealing means of said seatring and to provide at that point a stop shoulder to limit the depth of engagement of the plug within the seatring bore; said plug further having a lower generally plane terminating surface;

c. a number of throttling flow channels penetrating radially inward from the outer cylindrical surface towards the central, longitudinal axis of said plug, commencing the penetration of at least one channel slightly below said rim portion and terminating all channels within the lower terminating surface of said plug thereby providing a number of openings within said lower terminating surface of said plug disposed to provide access for fluid in a direction along the longitudinal plug axis, and wherein the major portion of the length of one or more of said flow channels are covered by the confining inner wall surface of said cylindrical seatring bore while the plug is fully engaged within said seatring bore, and wherein said channels are comprised of one or more penetrating grooves extending circularly at least partway around the interface between the reciprocating plug and said cylindrical seatring bore; each groove provided with one or more communicating vertical passage ways to the next groove.

3,908,699
HIGH PRESSURE FLUID SUPPLY AND QUICK ACTION VALVE

Charles F. Umphenour, and Reynaldo Calderon, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 224,735, Feb. 9, 1972, Pat. No. 3,800,832.
This application Jan. 28, 1974, Ser. No. 437,117
Int. Cl.² F16K *11/00*
U.S. Cl. 137—625.26 **5 Claims**

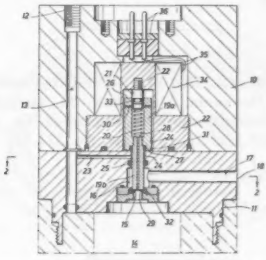
1. A high pressure fluid supply and quick action valve assembly for charging a chamber having an inlet-exit port, supply passage means to said chamber and exhaust passage means from said chamber comprising,

a. hollow elongated valve means having two-directional movement along its longitudinal axis and being spring biased in one direction against said inlet-exit port for charging said chamber with high pressure fluid,

b. fluid pressure passage means for applying an equal force in both of said directions to said hollow elongated valve means so that a minimum force is required to open said inlet-exit port,

c. said hollow elongated valve means being movable rapidly in a second direction to open said inlet-exit port suddenly for exhausting said high pressure fluid therefrom,

d. said hollow elongated valve means comprises a hollow elongated plunger slidably mounted in a housing containing said chamber,



e. said hollow elongated plunger having equal and opposite areas normal to said longitudinal axis for said equal and opposite forces to be applied thereto,

f. said hollow elongated plunger comprising first and second hollow elongated elements having inner and outer ends, the inner end of said second element being secured in the inner end of said first element,

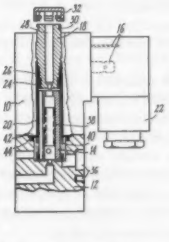
g. a stud fixed to said housing and protruding therefrom into the outer end of said first element, and

h. a spring positioned in said first element between said stud and said inner end of said second element for spring biasing said outer end of said second element against said inlet-exit port for charging said chamber with high pressure fluid.

3,908,700
SOLENOID VALVE

Jean Debaye, Montesson, France, assignor to Societe Anonyme des Etablissements Jouvenel & Cordier, France

Filed May 3, 1974, Ser. No. 466,902
Claims priority, application France, Sept. 5, 1973, 73.32023
Int. Cl.² F16K *31/06*
U.S. Cl. 137—625.65 **3 Claims**



1. A solenoid electro-valve comprising:

a valve body having therein a first valve seat separating a fluid inlet from a fluid outlet;

a unitary magnetic head including a solenoid winding and a magnetic circuit, said head being attached to said valve

body, said head forming a core receiving chamber with said valve body;

a magnetic yoke extending through said head from exterior thereof to said chamber, said yoke having an axial passage extending therethrough and a second valve seat;

a magnetic core positioned in said chamber and having thereon first and second valves for respective engagement with said first and second valve seats;

spring means for normally urging said core to cause said first valve to close said first valve seat;

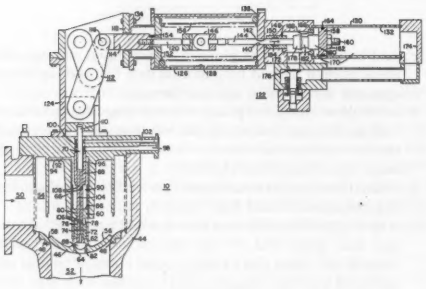
a narrow phase-shifting ring means surrounding a portion of said magnetic yoke positioned completely interiorly of said head for introducing a magnetic phase shift in said magnetic circuit; and

a magnetic sleeve retaining said ring means on said magnetic yoke.

3,908,701
THREE STAGE, DOUBLE TAPERED DASHPOT

Suryakant K. Dawawala, Glen Riddle, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 22, 1973, Ser. No. 372,721
Int. Cl. F16k *31/12*
U.S. Cl. 137—630.15 **7 Claims**



1. A damping arrangement for a valve having a movable plug having a predetermined velocity, said arrangement comprising:

a casing having a fluid therein;

a separator within said casing, an opening of a predeterminedd dimension extending through said separator;

connector means extending through said opening, said connector means attached to the movable plug;

means for forming said fluid within siad casing toward said opening to said separator;

a first snubber attached to said connector, said first snubber having a dimension less than the dimension of said opening,

a second snubber attached to said connector means a predetermined distance from said snubber, said second snubber having a predetermined dimension less than the dimension of said opening;

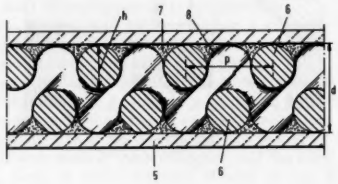
said fluid forced toward said opening in said separator by said forcing means being compressed against said separator by said first snubber as said first snubber approaches said opening, the compression of said fluid damping the velocity of said movable plug;

said fluid forced toward said opening in said separator by said forcing means being compressed against said separator by said second snubber as said second snubber approaches said opening, the compression of said fluid further damping the velocity of said movable plug.

3,908,702
MIXING FLUID COMPONENTS

Jan Arie Klosse, and Klaas Klosse, both of Hessenweg 211, De Bilt, Netherlands

Filed May 4, 1973, Ser. No. 357,269
Claims priority, application Netherlands, May 4, 1972, 7206016
Int. Cl.² B01F *05/00, 15/02*
U.S. Cl. 138—42 **4 Claims**

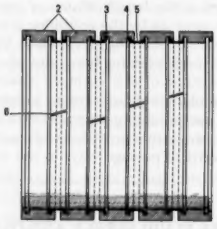


1. A mixing tube for use in transversely mixing fluid components together, said tube having an inner wall surface provided with a rounded male screw-thread configuration that provides a helical bore therethrough and having a height of about 0.5 times the diameter of the tube, and a pitch of from about 0.9 to about 1.1 times the diameter of the tube.

3,908,703
ARMOURED FLEXIBLE PIPE STRUCTURE

Claude Bournazel, Cernay-la-Ville; Michel Chatard, Chatou, and Pierre Grolet, Orgerus, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, France

Filed Feb. 5, 1974, Ser. No. 439,716
Claims priority, application France, Feb. 15, 1973, 73.05453
Int. Cl.² F16L *11/18, 11/00*
U.S. Cl. 138—120 **15 Claims**



14. An armoured flexible pipe structure comprising a plurality of successive rings, each ring defining two annular grooves in the internal wall thereof, and a plurality of annular elements having U-shaped cross sections, the arms of at least one U-shaped annular element engaging the adjacent grooves of a pair of adjacent rings thereby connecting said acjacent rings together, said arms engaging said annular grooves with a clearance.

3,908,704

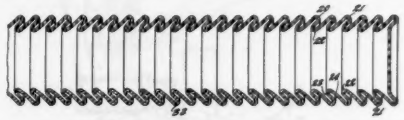
CORRUGATED TUBING

Ira T. Clement, Glen Mills, and Walter J. McCaw, Philadelphia, both of Pa., assignors to Penntube Plastics Company, Clifton Heights, Pa.

Filed Sept. 12, 1966, Ser. No. 578,836The portion of the term of this patent subsequent to June 30, 1986, has been disclaimed.

Int. Cl.[2] F16L *11/11*

U.S. Cl. 138—21 15 Claims



1. A plastic tubing of plastic of the class of polytetrafluoroethylene and a copolymer of tetrafluoroethylene and 5–35 percent of hexafluoropropylene, having a sequence of annular corrugations extending along the length of the tubing, said corrugations having a close-packed position in which they adjoin and the tube being stretchable until the corrugations assume a longitudinally spaced position, the wall thickness throughout the corrugations being substantially uniform, the corrugations having side walls one of which is long and the other of which is short, both of which extend at an acute angle with respect to the axis, the plastic having been heat set in close-packed position at a temperature within the following range for a time of at least ten minutes:

Polytetrafluoroethylene **450 - 500°** F.

A copolymer of tetrafluoroethylene and **5-35%** of hexafluoropropylene **300 - 400°** F.,

and the tubing when bent holding its bent shape without returning toward its previous shape.

3,908,705

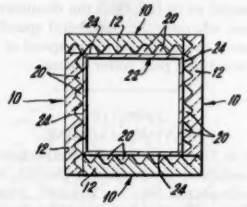
INSULATING COVER WITH OPEN PYRAMIDAL PASSAGEWAY PROJECTIONS

Chris J. Botsolas, Perth Amboy, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 56,820, July 21, 1970. This application Oct. 19, 1973, Ser. No. 407,868

Int. Cl. F16l *9/14, 9/22*

U.S. Cl. 138—149 2 Claims



1. An insulated duct comprising: a rectangular duct, four flat insulating blocks covering an entire outer surface of said duct, a multiplicity of discrete pyramidal projections extending from a side of each block, which abuts the duct in a uniform pattern of columns and rows; said pyramidal projections defining a network of interconnected open passageways through which upon contact with said duct a network of air passageways is formed between an insulated duct and said insulating block.

3,908,706

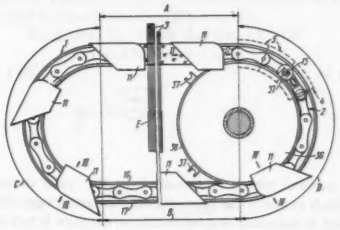
APPARATUS FOR PROPELLING WEFT THREAD CARRIERS IN A TRAVELLING-WAVE LOOM

Eduard Arshakovich Onikov, ulitsa Panferova, 5, korpus 2, kv. 106; Alexandr Alexandrovich Zabotin, Profsojuznaya ulitsa, 96, kv. 85; Valeryan Petrovich Lileev, ulitsa Nagornaya, 46/48, korpus 20, kv. 2; Zinovy Yakovlevich Rutkevich, Medvedkovo, 8 kvartal, korpus 18, kv. 21; Boris Alexandrovich Sakharov, ulitsa Krzhizhanovskogo 24/35, korpus 6, kv. 404, and Roman Anatolievich German, ulitsa Davydkouskaya, 30, kv. 50, all of Moscow, U.S.S.R.

Filed June 14, 1973, Ser. No. 370,055

Int. Cl.[2] D03D *47/26*

U.S. Cl. 139—12 6 Claims



1. An apparatus for propelling weft thread carriers across the warp and through successive travelling sheds of a travelling-wave loom, comprising, in combination: a closed guideway including straight portions, curved portions and side walls; an endless chain conveyor made up of a plurality of links and of interconnecting pins, disposed within said guideway for propelling therealong a plurality of said carriers, each having a spool rotatable about an axis; said conveyor being hidden within said guideway so that said carriers bear with their bottom surfaces upon said side walls; means for driving said conveyor; at least every second one of said pins, that interconnects the links, being made in the form of a bush with a retainer movable therein, for propelling by this retainer said carriers outside said sheds along said side walls, and with a supporting member carrying thereon a vertically arranged roller for propelling said carriers in said sheds; an opening provided in each of said carriers coaxially with the axis of rotation of said spool, for receiving therein said retainers as said carriers are propelled outside said sheds; a protective cloth having a selvage portion and disposed under said sheds on said guideway adjacent to and across said warp, said rollers being adapted to engage said carriers through said cloth as said carriers are propelled within said sheds across said warp.

3,908,707

DEVICE FOR THE DELIVERY OF PREDETERMINED WEFT LENGTHS IN A SHUTTLELESS WEAVING MACHINE

Gerardus Hendrikus Kaalverink, Asten, Netherlands, assignor to Ruti-Te Strake B.V., Deurne, Netherlands

Filed Dec. 20, 1973, Ser. No. 426,557

Claims priority, application Netherlands, Dec. 22, 1972, 7217617

Int. Cl.[2] D03D *47/36*

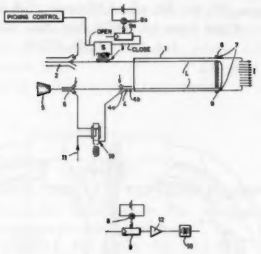
U.S. Cl. 139—122 H 4 Claims

1. A device for supplying weft yarn to a weft conveyor of a shuttleless weaving machine, comprising

a. intermittently operable means for drawing weft yarn from a yarn cop,

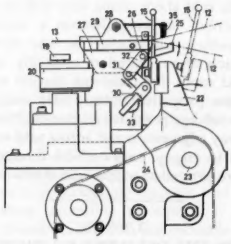
b. an elongated buffer reservoir having at one end a mouth to which weft yarn is fed by said yarn-drawing means and in which a length of the yarn is stored in the form of a loop having one leg extending from the buffer reservoir to the weft conveyor,

c. a yarn clamp arranged to engage said leg between the buffer reservoir and the weft conveyor,
d. means for intermittently opening the yarn clamp to permit the weft conveyor to convey yarn drawn from the buffer reservoir,
e. a yarn detector arranged to detect the end of said loop in the buffer reservoir at a point remote from the mouth thereof, and



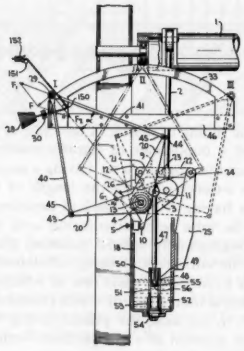
f. a control which is actuated by the yarn detector and which renders the yarn-drawing means inoperative when yarn is detected and operative when yarn is not detected, in order to cause the length of yarn in the buffer reservoir to be restored after yarn has been withdrawn from the buffer reservoir.

3,908,708
MEANS FOR GUIDING WEFT THREADS
Akira Nogai, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 21, 1972, Ser. No. 317,172
Claims priority, application Japan, Dec. 27, 1971, 47-1680
Int. Cl.[2] D03D *47/42*
U.S. Cl. 139—124 A **1 Claim**



1. In a shuttleless loom for weaving a fabric having a carrier for inserting a weft thread through a warp shed, a reed for bearing up said inserted weft and a reciprocable latch needle having a hook which is opened and closed by a latch for engaging the inserted weft thread and forming a loop in the weft, the improvement comprising a weft raising member pivotally supported adjacent an advanced position of said hook of said latch needle, and drive means for pivoting said weft raising member so that its weft engaging portion moves up and down in timed relationship with the operations of said carrier and said latch needle whereby said weft raising member is pivoted upward to raise the inserted weft thread against its tension at a point adjacent the advanced position of said hook of said latch needle and hence to cause said hook of said latch needle to pass under the raised portion of the inserted weft thread, said weft raising member being then pivoted downwardly rapidly to cause the inserted weft thread to be caught in said hook of said latch needle as the same becomes straight again owing to its own tension.

3,908,709
WEFT PICKING APPARATUS
Albert E. Moessinger, Epalings, Switzerland, assignor to Moessinger S.A., Fribourg, Switzerland
Filed May 27, 1971, Ser. No. 147,475
Claims priority, application Switzerland, May 27, 1970, 7829/70
Int. Cl. D03d *47/12*
U.S. Cl. 139—127 R **7 Claims**

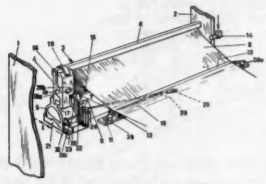


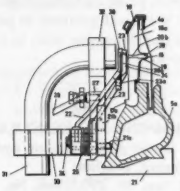
1. Weft picking apparatus for a shuttleless loom having a supply of weft yarn located outside of a shedforming area comprising:
retaining means for the weft yarn;
feed means for delivering the weft yarn from the supply to said retaining means;
pick roller means for catching the weft yarn between the supply and said retaining means;
means rotatably supporting said pick roller means and movable about an axis to oscillate said pick roller means and impart an acceleration to the weft yarn to project the weft yarn in a loop through the shed; and
drive means including a ramp having a configuration of a segment of a circle having a center coinciding with said axis of said supporting means and a drive roller element carried by said supporting means and riding on said ramp, said drive roller element rotatably driving said pick roller means as said supporting means is moved and having a diameter equal to or less than the diameter of said pick roller means whereby the peripheral speed of said pick roller means is at least equal to the speed of the weft yarn passing around said pick roller means.

3,908,710
WEAVING MACHINE
Hubert Peter Van Mullekom, Deurne, Netherlands, assignor to N. V. Machinefabriek L. Te Strake, Deurne, Netherlands
Continuation-in-part of Ser. No. 264,645, June 20, 1972, abandoned. This application Apr. 11, 1974, Ser. No. 459,868
Claims priority, application Netherlands, June 21, 1971, 718526
Int. Cl.[2] D03D *47/30*
U.S. Cl. 139—194 **6 Claims**

1. A weaving machine of the type having at least at one side a weft inserting device and at the other side, carried by the reed, a catching means and a clamping means cooperating therewith, for receiving, catching and tensioning weft threads launched through a weaving shed, characterized by a guiding

piece mounted to the reed adjustable in the weft direction and provided with a receiving channel situated in the insertion path of the weft thread, which channel deviates at its end remote from the weft inserting device into the beating up direction of the reed and has an opening on its beating up side extending along its complete length, the catching means being spaced in the beating up direction from the deviated end of





the receiving channel, and being movably mounted on the reed for movement, generally parallel to the shed, from a weft thread-receiving position to a clamping position in which the weft thread is clamped between the catching means and the clamping means, and mechanism actuated by movement of the reed toward its beating up position for moving the catching means toward its clamping position.

3,908,711

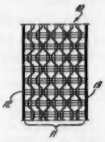
NARROW ELASTIC WAISTBAND FABRIC AND METHOD OF MANUFACTURING THE SAME

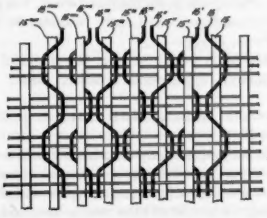
Richard Everett Goff, Jr., Barrington, and Normand Daniel Guay, Woonsocket, both of R.I., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 435,060, Jan. 21, 1974. This application May 1, 1974, Ser. No. 465,776

Int. Cl.[2] D03D *19/00*

U.S. Cl. 139—419 **14 Claims**





1. A lightweight narrow elastic waist-band fabric comprising two sets of warp yarns, the yarns of one of said warp yarns being elastic yarns selected from the group consisting of rubber core yarns and spandex core yarns, the yarns of the other of said warp set being doup yarns selected from the group consisting of stretch or texturized yarns, filament yarns and spun yarns, a plurality of said warp yarns woven in a reverse leno weave with each elastic yarn leno woven with a doup yarn, adjacent elastic yarns being leno woven alternately under and over the doup yarns so as to be disposed on opposite faces of the fabric and the outermost leno woven elastic yarns being disposed on the same face of the fabric and woven in a reverse leno weave with respect to each other.

3,908,712

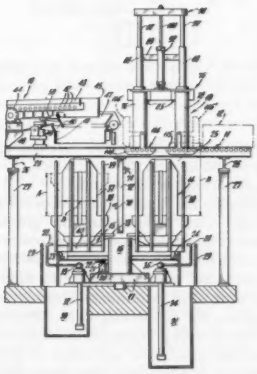
COIL-COMPACTING MACHINE AND METHOD

Hans Joachim Paletzki, Hagen, Germany, assignor to Georgetown Steel Corporation, Georgetown, S.C.

Filed Dec. 30, 1974, Ser. No. 537,428

Int. Cl.[2] B65B *13/20*

U.S. Cl. 140—1 **27 Claims**



1. A coil-compacting machine, comprising a base, an upstanding coil-locating spindle and means guiding and selectively vertically positioning said spindle with respect to said base; said spindle including at its lower end a radially outward platform formation adapted to receive and support coil stock applied over the upper end of said spindle, an upper frame structure establishing a horizontal plane of support above said spindle when the latter is in its retracted-down position, and selectively operable clamp-adapter means carried by said upper frame structure; said clamp-adapter means comprising an annular pressure plate positioned above said spindle when in retracted-down position and having a central opening sized to accommodate upward insertion by said spindle, a connection plate engageable by said spindle when elevated, means for detachably locking said connection plate and spindle when elevated, and axial-force actuator means reacting between said connection plate and said pressure plate for applying axially compressive force to compact coil stock between said pressure plate and said platform formation; whereby, said spindle and said clamp-adapter means coact to define a unitary coil-compressing clamp when said connection plate and spindle are locked together.

3,908,713

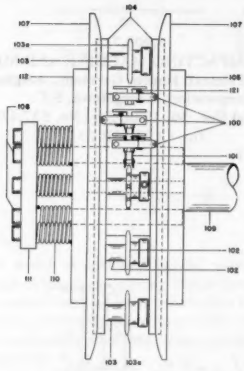
ASSEMBLIES FOR MAKING CABLE BEADS

Leslie L. Randall, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 228,988, Feb. 24, 1972, Pat. No. 3,805,852. This application June 11, 1973, Ser. No. 368,860

Int. Cl.[2] B21F *45/00*; B29H *17/34*; B21F *37/00*

U.S. Cl. 140—71 R 9 Claims



1. Apparatus for rotating an annular core and ensuing bead while wrapping strand around the core which comprises:

housing for supporting the apparatus,

means for attaching the housing to a supporting base

gripping means which include movable gripping jaws to exert pressure against the bead from opposite sides of the plane of symmetry of the bead which contains its entire circumference and perpendicularly to such plane, for driving the bead at predetermined constant velocity

supporting means for supporting each gripping jaw with respect to which each gripping jaw is independently movable toward and away from said plane of symmetry,

means for moving said gripping jaws on endless paths and all at the same velocity on the paths into and out of engagement with the bead surface said paths being arcuate over the portion in which the gripping jaws engage such surface,

pressure applying means movable with respect to the housing for forcing the gripping jaws into engagement with the bead and maintaining pressure thereon characterized by automatic compensation means for allowing growth of the bead as strand is applied, such compensation means acting perpendicularly to the aforesaid plane of symmetry of the bead, and

means for separating the gripping jaws to insert and remove the bead.

3,908,714

DEVICE FOR MANUFACTURING A LAMP

Jean Rochet, Asnieres, France, assignor to Jean Rochet SA, France

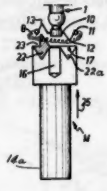
Division of Ser. No. 336,248, Feb. 27, 1973, Pat. No. 3,837,371. This application Aug. 9, 1974, Ser. No. 496,165

Claims priority, application France, Feb. 29, 1972, 72.06850

Int. Cl.[2] B21F *45/00*

U.S. Cl. 140—71.5 7 Claims

1. Apparatus for manufacturing a lamp of the type receptive of a lamp base having a longitudinal axis and radially projecting filament supports projecting therefrom and lying in substantially a common plane and connected to a filament at one end portion thereof farthest from said longitudinal, said apparatus comprising means for forming a portion of each filament support including said one end portion thereof into a V-



shaped configuration lying in a plane substantially perpendicular to said common plane including means for forming alternate ones of said V-shaped portions to point in one longitudinal direction and the remaining ones to point in the opposite longitudinal direction.

3,908,715

METHOD OF JOINING WIRES, STRANDS AND CORDS

Roger Spiessens, Dentergem, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Nov. 30, 1973, Ser. No. 420,618

Claims priority, application United Kingdom, Jan. 18, 1973, 2640/73

Int. Cl.[2] B21F *7/00*

U.S. Cl. 140—111 13 Claims

1. A method of forming a wire strand comprising:

a. joining two wires each having a diameter in the range of 0.10 to 0.30 mm by

1. holding said wires fast with respect to one another at two spaced locations, and

2. twisting said wires at least two complete turns between said locations so as to form a joined wire,

b. stranding at least one such joined wire with other wires to form a strand.

3,908,716

METHOD AND APPARATUS FOR DISTRIBUTING A LIQUID IN THE FORM OF A MULTIPLICITY OF DOSES

Claude Matte, Paris, and Jean-Jacques Gener, Vitry-sur-Seine, both of France, assignors to Centre National de Transfusion Sanguine, Paris, France

Filed Mar. 14, 1974, Ser. No. 451,295

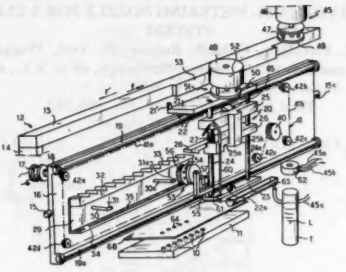
Claims priority, application France, Mar. 22, 1973, 73.10392

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—1 8 Claims

1. A method for sequentially discharging into a multiplicity of containers fractions of a liquid material sampled from a liquid containing receptacle, comprising the steps of: dipping a probe forming a first end of tube means into said receptacle; sucking in liquid material to be sampled into said tube means through said probe by first pump means; removing said probe from said receptacle; sucking in a rinsing liquid at the end of said tube means opposite said probe by second pump means;

displacing said probe above and along said containers while continuing to suck in said rinsing liquid whereby the liquid to be sampled is pushed toward the outlet of said probe where it



forms a micro-drop attached to the probe; and suddenly relatively striking said probe to effect discharging of said micro-drop into a container which registers with the actual position of said probe when the same is suddenly relatively struck.

3,908,717

APPARATUS FOR FILLING BEER CANS OR THE LIKE

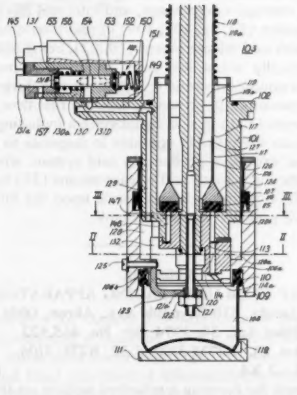
Friedrich Rademacher, Kamen; Karl Quest, Dortmund; Uwe Knabe, Dortmund-Hombruch; Dieter Unger, Waltrop; Heinz Jordan, Dortmund-Korne; Werner Heckmann, Dortmund, and Karl Plock, Dortmund-Lucklemberg, all of Germany, assignors to Holstein & Kappert Maschinenfabrik Phonix GmbH, Dortmund-Lucklemberg, Germany

Division of Ser. No. 175,673, Aug. 27, 1971, Pat. No. 3,807,463. This application Jan. 8, 1974, Ser. No. 431,726

Claims priority, application Germany, Aug. 29, 1970, 2042990

Int. Cl.² B65B *31/00*; B67C *3/26*

U.S. Cl. 141—46 **8 Claims**



8. In a filling device for admission of liquids into cans or analogous containers, a combination comprising guide means; an annular sealing member movable along said guide means upwardly away from and downwardly toward an empty container therebelow, said sealing member having a lower portion provided with annular recess means; and container-engaging deformable annular gasket means provided in said recess means and having at least one internal recess to promote its deformability in response to engagement with the mouth of a container therebelow.

3,908,718

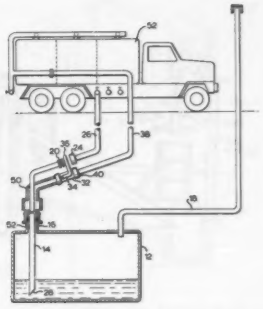
VAPOUR RECOVERY SYSTEMS OF LIQUID FUEL STORAGE

Allen M. Bower, Conneaut, Ohio, assignor to Emco Wheaton Inc., Conneaut, Ohio

Continuation-in-part of Ser. No. 319,882, Dec. 29, 1972, abandoned. This application June 20, 1974, Ser. No. 481,046

Int. Cl.² B65B *3/04*; B67C *3/26*; F16L *29/00*

U.S. Cl. 141—59 **6 Claims**



1. In a system for loading a liquid fuel storage tank having a vapour recovery line opening outwardly therefrom for connection to a vapour recovery line of a vapour recovery system and a filling line opening outwardly therefrom for connection to a filling line of a tank truck, the improvement comprising coupler means interposed between said vapour recovery line of said storage tank and vapour recovery line of said vapour recovery system, said coupler means including a coupler mechanism which is movable between an operative coupling position and an inopertive release position only when the coupler is engaged by a vapour recovery line of said vapour recovery system, and handle means projecting from said coupler mechanism for moving said coupler mechanism between said operative and inoperative positions, said handle means having an extent adapted to project into the path of said filling line at a break in said line when said coupler means is in a closed position so as to prevent the filling of said tank when said vapour recovery lines are uncoupled and said handle being remote from said break in said filling line when said coupler means is in said operative position thereby permitting said tank to be filled by way of said filling tube.

3,908,719

INSTALLATION FOR FILLING DRUMS WITH LIQUID YELLOW PHOSPHORUS

Leo Berg, Hurth-Alstadten; Erhard Johann Lenemann, Middelbourg, both of Netherlands, and Johannes Wilhelmus Kinneging, Schwalback, Hesse, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 280,806, Aug. 15, 1972, Pat. No. 3,834,622. This application Mar. 15, 1974, Ser. No. 451,425

Claims priority, application Germany, Aug. 18, 1971, 2141314

Int. Cl.² B65B *3/04*; B67C *3/26*

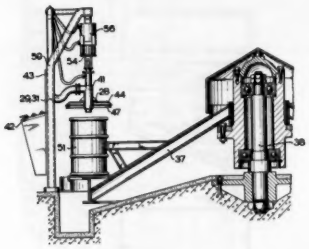
U.S. Cl. 141—82 **5 Claims**

1. An installation for filling drums with liquid yellow phosphorus, the installation comprising a roller track receiving empty drums and being arranged in inclined position with respect to, and terminating ahead of, an annular rotating table receiving the empty drums coming from the roller track and being mounted in the manner of a turret in the pivot on a vertical shaft; a stationary filling column arranged on the periphery of the rotating table, and filling the empty drums through a filling nozzle secured thereto; a driven roller track

arranged level with the rotating table for conveying the filled drums; a deflecting means arranged on the periphery of the rotating table for delivering the filled drums to the driven roller track; a vertically displaceable trolley being movable, on a bracket secured to the stationary filling column by means of a plurality of first lifting cylinders lifting the trolley and the filling nozzle connected thereto; the filling nozzle being comprised of:

a. a plurality of coaxial tubes,

b. a double-walled tubular inlet delivering yellow phosphorus and warm water, respectively,



c. a water inlet and a water outlet,

d. a first supporting flange being secured to the outer of said coaxial tubes, and

e. a second supporting flange being secured to the head of one of the inner of said coaxial tubes,

said second supporting flange connecting the filling nozzle to the trolley; a drum cover being secured to a supporting cross and to the first supporting flange of the filling nozzle, and being placed on the drums on lowering the trolley; and a switch and control console arranged at the outside of the stationary filling column.

3,908,720

CONTROL OF DUST DURING DISCHARGE OF MATERIALS INTO HOPPERS

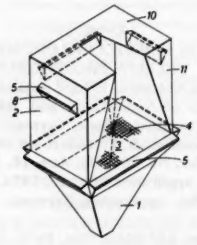
George William Garnett, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 19, 1973, Ser. No. 407,955

Claims priority, application United Kingdom, Oct. 19, 1972, 48204/72

Int. Cl.[2] B01D *45/02;* **B07B** *9/02;* **B65B** *1/28*

U.S. Cl. 141—93 **9 Claims**



1. Dust-control apparatus for a hopper, the said apparatus being located adjacent the top of the hopper and comprising a substantially horizintal grid, at least one dust-settling chamber surrounding the grid, a plurality of apertures located above the grid and permitting access of dust from above the grid into the upper part of the chamber, a plurality of apertures located below the grid and permitting access of dust from below the grid into the lower part of the chamber, at least one dust-extracting vent in the wall of the chamber and means for connecting the vent to dust-extracting ducting.

3,908,721

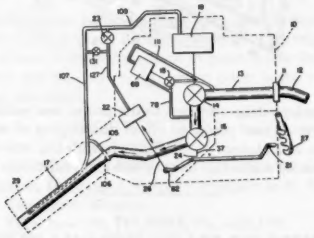
AUTOMATIC FUEL METERING NOZZLE FOR A CLOSED SYSTEM

Dean C. McGahey, Fishkill; Eugene W. Vest, Wappingers Falls, and Edward A. Mayer, Newburgh, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 9, 1973, Ser. No. 358,763

Int. Cl. B65b *3/26*

U.S. Cl. 141—128 **9 Claims**



1. Automatic flow dispensing nozzle having a fuel passage adapted for communication with a pressurized source of fuel, and being further adapted to sealably engage the filler tube of a tank to be filled with said fuel, thereby to form a substantially closed system,

valve means (**14, 16**) in said fuel passage (**13, 17**) being adjustable to an open condition to regulate the flow of fuel entering said tank from said pressurized source, to a maximum flow,

release means (**19, 22**) operably connected to said valve means (**14, 16**) to actuate the latter and to regulate fuel flow therethrough in response to a signal created by fuel flowing through said passage, and into said filler tube,

a signal system (**23, 31, 107, 109**) in said nozzle communicated with said release means (**19, 22**), being operable to automatically adjust said valve means in response to a pressure condition within said fuel passage during a tank filling operation, to provide a reduced fuel flow, and

bypass means (**131**) in said signal system including at least one bypass valve (**131**) operable in response to a predetermined excessive pressure in said system, whereby to automatically actuate said release means (**22**) to discontinue fuel flow through said nozzle upon the build-up of excessive pressure within said tank.

3,908,722

GOLF CLUB HEAD FACING APPARATUS

William H. Jacobs, 510 Reynolds Ave., Akron, Ohio 44313

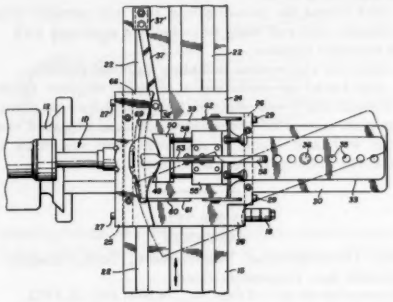
Filed Apr. 30, 1974, Ser. No. 465,522

Int. Cl.[2] B27M *3/00, 3/22;* **B27C** *5/06*

U.S. Cl. 144—2 XA **8 Claims**

1. Apparatus for forming a spherical surface on the hitting face of a wood golf club comprising, a fixed support plate, a radius arm having a pivot on said plate for arcuately swinging its free end about said pivot in the plane of said plate, means fixedly mounted on the free end of said arm for holding a wood golf club head having a hitting face thereon in upright position, means for swinging the radius arm on its pivot, and rotatable cutter means axially perpendicular to the hitting face of said head when the radius arm and cutter means are aligned, said cutter means bodily axially movable into contact with the hitting face and having at least one radially offset

outwardly projecting bit adapted for defining a circular cutting line resulting in a generated spherical surface on the club



hitting face as the radius arm swings the head across the cutter.

3,908,723

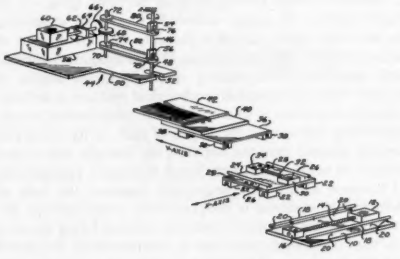
NUMERICAL CONTROLLED BANDSAW FOR KEYBOARDS

Robert S. Hill, Holly Springs, Miss., assignor to The Wurlitzer Company, Chicago, Ill.

Filed Mar. 25, 1974, Ser. No. 454,443

Int. Cl.[2] B27B *13/00*

U.S. Cl. 144—2 R **7 Claims**



1. Apparatus for cutting a workpiece in a predetermined pattern comprising a machine having a base and a cutting blade, a three axes numerical control system having first, second and third axis control information, a workpiece support movably supported from said base, means for moving said workpiece support in a first axis direction in accordance with first axis control information, means for moving said workpiece support in a second axis direction in accordance with second axis control information, and means for turning said cutting blade in accordance with third axis control information to maintain a cutting edge of said cutting blade facing substantially in the direction of the cut through the workpiece during a cutting operation and to maintain a non-cutting edge of said blade facing in the direction of said cut during removal of the workpiece.

3,908,724

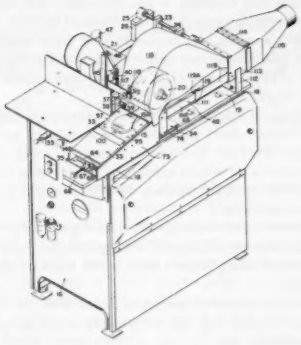
APPARATUS FOR CONTOURING SURFACES OF ARTICLES

Robert W. Tracy, Haverhill, Mass., and Richard D. Cushing, Newton, N.H., assignors to Circle Machine Co., Inc., Seabrook, N.H.

Filed Mar. 25, 1974, Ser. No. 454,217

Int. Cl.[2] B27C *5/00;* **B23D** *67/00*

U.S. Cl. 144—143 **22 Claims**



1. Apparatus for contouring a surface of an article such as a shoe sole platform, said apparatus comprising a carriage reciprocable between a loading and unloading starting position and a remote position, means to reciprocate said carriage between said positions, a rotatable contouring member, means supporting said member for movement toward and away from the path of the carriage, a drive for said member, said carriage including a work holder connected thereto, said holder including means operable to clamp an article thereto, the path of said carriage being so spaced from the periphery of the cutting member that only the article is engageable therewith during carriage travel, control means operative to provide a cycle in which the carriage advanced from its starting position to its remote position and returned to its starting position, with the article clamping means operative during carriage travel and released at said starting position, and a cam carriage and operable to more the cutting member relative to the clamped article to effect the desired contour thereof during its travel.

3,908,725

METHOD FOR PRODUCING PARALLEL LAMINATED PINE LUMBER FROM VENEER

Peter Koch, Alexandria, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 1, 1974, Ser. No. 438,716

Int. Cl.[2] B27D *1/04*

U.S. Cl. 144—317 **1 Claim**

1. A method for producing parallel, laminated lumber from one-quarter-inch thick pine veneer, which method consists of the following steps carried out in sequence:

a. peeling pine logs to produce veneer one-quarter of an inch thick, which veneers exhibit an upper or tight side and a lower or loose side as a consequence of the veneer side location relative to the veneer peeler knife edge, the tight side being that side distal the knife edge, the loose side being that side proximal the knife edge;

b. clipping the veneers of step (a) to produce veneer sheets of standard width appropriate for a preselected glue press;

c. drying the clipped veneer sheets of step (b) to a moisture content of about from 4 to 6 percent;

d. composing and clipping the dried veneer sheets of step (c) into widths which widths will of themselves or with

other widths yield a composite one-quarter-inch thick veneer sheet of a width dimension compatible with said preselected glue press;

e. laying up and gluing with a heat-setting, exterior type glue, three of the one-quarter inch thick veneer sheets of step (d) to produce a ply slab of length dimension compatible with said preselected glue press, the laying-up and gluing step being carried out in conformance with the following three operational provisos,

1. orienting the grain of all of the three veneer sheets parallel and running in the direction that will be the lengthwise dimension of the finished lumber,
2. stagger-spacing any requisite butt joint in the veneer sheet plies from any other immediately adjacent butt joint over the range eight and one-half inches to seventeen inches,
3. forming all interior glue bonds between a tight side of one veneer sheet ply and a loose side of an adjacent veneer sheet ply to produce a three-ply slab, one exterior surface of which exhibits a veneer sheet tight side, the other exterior surface of which exhibits a veneer sheet loose side;

f. gluing with a cold-setting, waterproof glue, a pair of three-ply slabs from step (e) and forming the glue joint between the corresponding veneer sheet loose sides of each three-ply slab;

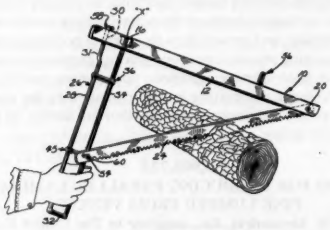
g. pressing the glued three-ply slabs of step (f) until such time as the glue has set to produce a six-ply panel 1½ inches thick;

h. ripping and cross-cutting the six-ply panel of step (g) to produce lumber of preselected width and length.

3,908,726
COLLAPSIBLE HAND SAW

Richard E. Swenson, 17116 Vermillion Rd., Duluth, Minn. 55803

Filed Jan. 4, 1974, Ser. No. 430,687
Int. Cl.² B27B *21/02*
U.S. Cl. 145—33 E **2 Claims**



1. A collapsible hand saw comprising:

a. an elongated back bar having inner and outer ends,

b. a saw blade pivotally connected at its outer end to outer end of the back bar and adapted to be pivotally moved into and out of alignment with the back bar,

c. a handle having upper and lower ends,

d. means engaging the inner end of the blade to the lower end of the handle,

e. said handle having shoulder means on the upper end thereof for pivotal contact and bearing engagement with said back bar,

f. said handle having rigid means on the upper end thereof for releasable engagement with said back bar and spaced from said shoulder means,

g. means for securing said rigid engagement means of said handle to said back bar while said handle is pivoted on said shoulder means of the handle to also bias said blade into an extended position on said handle and said back bar,

h. said back bar being channel-shaped in cross-section and including spaced side walls joined by a bottom portion,

i. said shoulder means of said handle including a front rod portion thereof, and

j. said releasable securement means of said handle including a rear rod portion,

k. said means for securing said rear rod portion means includes said rod being threaded and equipped with

l. a threaded member,

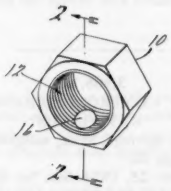
m. said rear rod portion including an offset portion,

n. said back bar including a retainer member thereon through which said offset portion of said draw-up rear rod portion is inserted and secured with said threaded member with said blade in alignment with said back bar thereby holding the saw in collapsed condition.

3,908,727
FASTENER

Thomas Dixon Osborne, Murfreesboro, Tenn., assignor to Microdot Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 274,598, July 24, 1972, abandoned. This application June 7, 1974, Ser. No. 477,176
Int. Cl.² F16B *39/34*
U.S. Cl. 151—7 **2 Claims**



1. In a threaded fastener having threads whose crests lie on an imaginary cylindrical surface: means defining a generally round, concave cavity having surface portions lying on an imaginary surface of partly spherical form and extending radially into and axially across a plurality of convolutions of the fastener thread; the rim portions of said imaginary surface of partly spherical form making relatively small angles of intersection with said imaginary cylindrical surface, a deformable material deposited in said cavity in an undeformed condition and filling said cavity; the depth of said cavity being not substantially greater than the depth of the threads, said angles of intersection being sufficiently small that upon engagement of said fastener with a complementary fastener, the bulk of said deformable material is progressively compressively deformed from its undeformed condition without being sheared away by the rim of said cavity and is compressively deformed between the two engaged fasteners such that a generally radially directed locking force is provided between the two engaged fasteners, which locking force is distributed over the entire surface of said cavity.

3,908,728
TIRE REMOVING TOOL

Louis D. DeMola, 810 Danehurst Ave., Glendora, Calif. 91740

Filed Jan. 6, 1975, Ser. No. 538,573
Int. Cl.² B60C *25/02*
U.S. Cl. 157—1.22 **4 Claims**

1. A tire removing tool comprising:

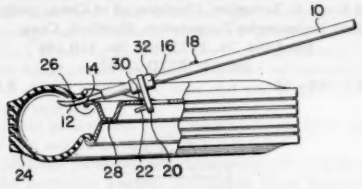
an elongated bar having means at a first tip thereof for forcing the inner periphery of a tire on a rim across the outer periphery of the rim, the rim having a central hole with an inner periphery;

a collar slidable along the bar;

an extension secured to the collar and extending outward at

right angles to the bar; and

a second tip secured to the extension, parallel to the bar and



pointing toward the first tip, said extension and second tip being adapted to engage the inner periphery of the rim.

3,908,729

MACHINE FOR SCREWING THE NUTS OF WHEEL-SPOKES

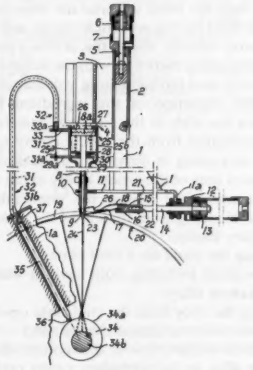
Julien Carminati, 13, Avenue du Thiou, 74 Annecy, France

Filed Oct. 11, 1973, Ser. No. 405,850

Claims priority, application France, Oct. 11, 1972, 72.39982

Int. Cl.² B23P *19/00*

U.S. Cl. 157—1.5 **6 Claims**



1. A machine for tightening the nuts of wheel spokes, comprising a spoke nut tightening station, means for rotatably supporting a wheel the spokes of which are to be tightened so that the spoke nuts pass said nut tightening station, means at the tightening station for engaging the spoke nuts in turn, means driving said nut engaging means for nut tightening rotation, adjustable torque limiting means in said driving means, means for controlling the maximum torque to be applied to said nut engaging means in response to the rotation of said wheel supporting means for sequentially varying the applied torque from nut to nut according to the positioning of each nut in the order of tightening, and means for driving the wheel supporting means for stepwise rotation to bring the individual nuts in register with said nut tightening station, said means for controlling including a cam coaxial with said wheel supporting means and means for connecting said cam to a wheel carried by said wheel supporting means.

3,908,730

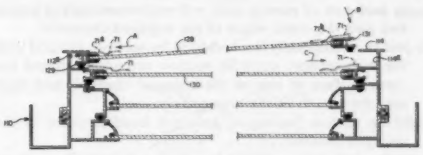
STORM WINDOW

Lorane C. Goss, Jr.; James T. Cribben, both of Mechanicsburg, and Joseph J. Miller, Plainfield, all of Pa., assignors to Capitol Products, Mechanicsburg, Pa.

Filed Apr. 15, 1974, Ser. No. 460,693

Int. Cl.² E06B *3/32*

U.S. Cl. 160—90 **12 Claims**



1. A storm window or window assembly comprising a frame adapted to be installed in an opening in a building or wall; said frame being of a generally rectangular construction including a head frame, a sill frame and side jambs connected thereto, an upper sash and a lower sash mounted in said frame; an upper storm sash and a lower storm sash mounted in said frame; said head frame, sill frame and side jambs having tracks therein for receiving said upper and lower sashes and said upper and lower storm sashes; each of said storm sashes including a top rail, a bottom rail and stiles connected thereto; a guide spring assembly on each end of said top rails and each end of said bottom rails for releaseably connecting said storm sashes to said side jambs of said frame each of said guide spring assemblies comprising a guide spring and spring receiving and retaining means, said spring receiving and retaining means includng a pair of slots fixed in each end of said top rails and in each end of said bottom rails, each of said guide springs being mounted in said spring receiving and retaining means therefor so as to be depressible from a position externally of the rail thereon to a position inwardly towards said rail, thereby enabling said storm sashes to be positioned in or removed from said tracks therefor, said pair of slots in each end of said top rails and each end of said bottom rails being so positioned in said rails and said guide springs being so positioned in their respective slots that when said storm sashes are installed in said tracks therefor and said guide springs are in their normal relaxed position, the edge of each of said guide springs facing their respective side jambs abuts an edge of a track member forming a side of said tracks for said storm sashes.

3,908,731

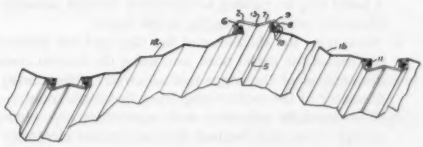
HINGE AND PANEL ASSEMBLY FOR FOLDING DOOR

William Runka, 8706 Strathearn Drive, Edmonton, Alberta, Canada

Filed June 19, 1973, Ser. No. 371,399

Int. Cl.² E06B *9/00*

U.S. Cl. 160—231 A **5 Claims**



1. In a folding door comprising a plurality of rigid panels interconnected by longitudinal hinge members and adjustable between fully extended and stacked positions, the improvement comprising:

each said panel having its longitudinal edge portions bent to form a pair of channels extending from opposite sides of

the panel, each longitudinal edge forming a channel mouth with the body of the panel,

each said hinge member engaging one pair of adjacent, oppositely disposed channels of one pair of adjacent panels, each of said channels being on an outer side of said pair of adjacent panels when in said stacked position; said hinge member comprising, when viewed in cross section in the stacked position,

a web section positioned transversely and externally relative to said pair of panels, said web section extending across and past the outer edges of the engaged channels,

a pair of substantially hook-shaped lip sections integral with the web section, each lip section extending around the outer surface of one of the engaged channels and back into the mouth of the engaged channel,

said lip section having an enlarged head retained in the engaged channel;

said lip and web portions being of substantially uniform thickness and sufficiently flexible across their breadth whereby, when the engaged panels are pulled to the fully extended position, the lip sections turn with the panels and the web section bends along its longitudinal centerline;

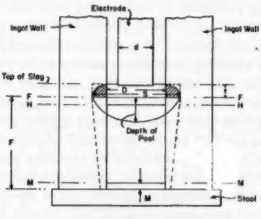
said web section being of sufficient width and rigidity whereby each pair of adjacent panels are thereby maintained in spaced apart relation in the stacked position.

3,908,732

METHODS OF PRODUCING LARGE STEEL INGOTS

Lloyd R. Cooper, Pittsburgh, Pa., assignor to Heppenstall Company, Pittsburgh, Pa.

Filed Dec. 21, 1973, Ser. No. 427,085
Int. Cl.² B22D *27/02*
U.S. Cl. 164—4 **7 Claims**



1. The improved method of producing large steel ingots with higher yield from poured weight to wrought product comprising the steps of

a. Casting a steel ingot to the final desired size, with all of the cast steel weight in the ingot body and free from sinkhead on top of the ingot body,

b. Removing an axial core lengthwise of said cast ingot to form a central cavity,

c. Melting a steel electrode within said central cavity under a fused slag by passing an electrical current through said electrode within the cavity to the ingot,

d. Measuring the thickness of the slag and the distance to the top of the metal pool, and using the known constant dimensions of the ingot and electrode determining the diameter of the molten slag layer and metal pool,

e. Consequently adjusting and controlling the electrical energy input and the heat balance of the electrode and ingot body by controlled preheating of the ingot so as to proportionally melt the steel electrode within the central cavity under the fused slag and at the same time melt a desired uniform portion of the ingot wall and refine the melted portions by reaction with the fused slag; and

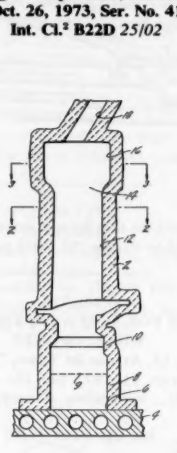
f. Solidifying the melted electrode metal within the cavity to form a solid ingot mass.

3,908,733

METHOD AND APPARATUS FOR CONTROL OF ALLOY IN COLUMNAR GRAIN CASTINGS

Geoffrey R. Brazer, Manchester; Patrick M. Curran, Tolland, and Bruce E. Terkelsen, Cheshire, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 26, 1973, Ser. No. 410,146
Int. Cl.² B22D *25/02*
U.S. Cl. 164—60 **8 Claims**



1. In the manufacture of columnar grained cast articles from a high temperature alloy having as an ingredient an element that reacts with the mold material the steps of:

making a mold having an article cavity and a large secondary cavity directly above the article cavity and directly communicating therewith with the second cavity acting as a reservoir and having a large volume-to-surface ratio to minimize depletion of the ingredient by the reaction between the alloy in the reservoir and the mold material the connection from the article cavity to the secondary cavity increasing in dimension in all directions from the maximum area of the article cavity at the top to the larger in-area secondary cavity, the connection providing a gradual blending from the top of the article cavity to the secondary cavity;

positioning the mold on a chill plate;

filling the mold including both cavities with a molten high temperature alloy;

solidifying the alloy from the chill plate upward to form one or more columnar grains therein; and

causing a convective flow in the molten alloy such that the molten alloy in the secondary cavity replenishes the depleted ingredient in the alloy in the article cavity during solidification.

3,908,734

METHOD AND APPARATUS FOR GAS SHROUDING OF LIQUIDS

Bernard Robert Pollard, Aliquippa, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

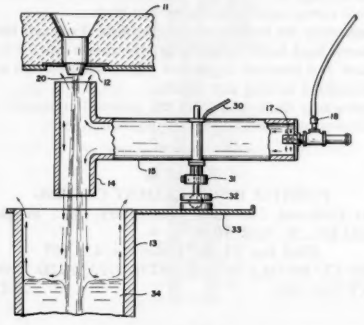
Filed Mar. 5, 1973, Ser. No. 337,999
Int. Cl.² B22D *11/10*
U.S. Cl. 164—66 **18 Claims**

1. A method for providing a protective gaseous atmosphere around a liquid stream during transfer between containers, comprising:

a. passing said liquid stream from an exit opening of a first container through an unconfined protective gaseous atmosphere which is moving at least in a direction opposite to that of said liquid stream and which is located between said first container exit opening and an end of an open-ended tube;

b. further passing said liquid stream from said unconfined protective atmosphere into said tube and through a protective atmosphere which is confined by said tube in a direction generally parallel to that of said liquid stream;
c. further passing said liquid stream from the other end of the tube and said confined protective atmosphere through an unconfined protective gaseous atmosphere which is moving at least in the same direction as that of said liquid stream and which is located between said other end of said open-ended tube and said second container entry opening;
d. further passing said liquid stream into the entry opening of said second container; and
e. selectively removing said open-ended tube together with said protective gaseous atmosphere from between said first and second containers and replacing said tube and said protective gaseous atmosphere thereafter.

9. Shrouding apparatus for providing a protective gaseous atmosphere around a liquid stream during transfer between containers in combination with distribution means which comprise a first container having a liquid exit opening for passing the liquid stream through said shrouding apparatus



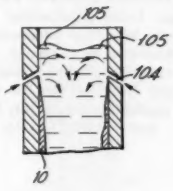
and into collection means which comprise a second container having a liquid entry opening, said shrouding apparatus comprising:

a. a first tubular member having open ends positioned between said liquid exit opening of said first container and said liquid entry opening of said second container without contacting said first and second containers so as to be able to observe said liquid stream during its transfer between said first and second containers and to provide access to said liquid exit and entry openings;
b. a second tubular member attached to said open ended first tubular member so as to form an interconnecting passageway suitable for the passage of a protective gas between said tubular members;
c. said second tubular member being rigid and connected to positioning means which comprise pivot means for placing and removing said first tubular member from between said liquid exit opening in said first container and said liquid entry opening in said second container; and
d. gas delivery means for passing a protective gas into and through said second tubular member and, thereafter, into said first tubular member so as to cause the protective gas to exit from the open ends of said first tubular member.

3,908,735
METHOD AND DEVICE FOR THE CONTINUOUS CASTING OF KILLED STEEL WITH ARTIFICIAL WILDNESS

Armando Di Candia, Genoa, Italy, assignor to Italsider S.p.A., Genoa, Italy

Filed June 4, 1973, Ser. No. 366,428
Claims priority, application Italy, June 6, 1972, 12706/72; Aug. 22, 1972, 12857/72
Int. Cl.² B22D *11/10*
U.S. Cl. 164—66 **4 Claims**

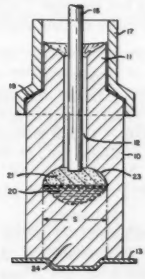


1. In a method for the continuous casting of killed steel into a mold by means of a tubular member reaching downwardly into the mold, wherein an inert gas is blown into the mold simultaneously with the molten steel, the improvement comprising blowing said inert gas into the top portion of the ingot being cast through the mold side walls just under the top surface of the ingot being cast and above the layer of steel hardening on the inner surface of the mold walls so that a continuous wave is formed and sustained in said top surface of the ingot being cast, said continuous wave washing impurities in the molten steel to the surface of the ingot being cast to thus prevent the concentration of impurities at the interface between the hardening steel and the still liquid steel.

3,908,736
METHODS OF PRODUCING LARGE STEEL INGOTS

Lloyd R. Cooper, Pittsburgh, Pa., assignor to Heppenstall Company, Pittsburgh, Pa.

Filed Oct. 9, 1973, Ser. No. 404,246
Int. Cl.² B22D *27/02*
U.S. Cl. 164—52 **4 Claims**



1. The method of producing large steel ingots with a refined central zone comprising the steps of:

a. Casting a steel ingot of the required final size having an excess of metal over that finally required;
b. Forming an axial central cavity through the full length of the ingot, having a minor cross sectional area of the ingot;
c. Progressively melting and refining the central zone of the ingot around the central axial hole by passing an electrical current through a fused refining slag in the central hole by way of an electrode positioned within the

central axial hole to the ingot to melt a major cross sectional area of the ingot, and wherein the electrode is not consumed during the remelting process, and the metal to complete the filling of the axial central hole is obtained totally from the initial ingot; and

d. Progressively resolidifying the melted metal within the central zone to form a solid ingot mass.

3,908,737

METHOD FOR PRODUCING GRAIN-ORIENTED ELECTRICAL STEEL SHEET UTILIZING A CONTINUOUS CASTING PROCESS

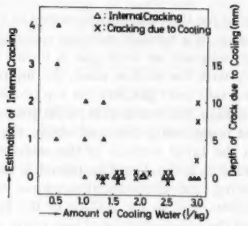
Hisashi Matsunaga; Izumi Matsushita; Kenzou Iwayama; Minoru Motoyoshi; Masafumi Okamoto; Tomohiko Sakai, and Takahide Shimadzu, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed July 29, 1974, Ser. No. 492,867

Claims priority, application Japan, July 31, 1973, 48-86249

Int. Cl.[2] B22D *11/16*

U.S. Cl. 164—76 **2 Claims**



1. In a method for producing a grain-oriented electrical steel sheet having magnetic properties which are stable at a high level and which is free from blister of the type comprising continuously casting a molten steel containing 2.0 percent to 4.0 percent Si, 0.035 to 0.08 percent C, 0.03 to 0.10 percent Mn, 0.01 to 0.03 percent S and not more than 0.005 percent sol. Al into a slab and heating, hot rolling, cold rolling and annealing the slab, the improvement which comprises cooling the slab during the continuous casting rapidly with cooling water in an amount of not less than 1.6 *l*/kg of steel within a range which does not cause cooling cracking of the slab.

3,908,738

METHOD OF POSITIVE DISPLACEMENT BONDING OF BATTERY COMPONENTS

John A. Bruzas, Trenton, N.J., and William E. Coville, Morrisville, Pa., assignors to Gould Inc., St. Paul, Minn.

Filed Jan. 21, 1974, Ser. No. 435,156

Int. Cl.[2] H01M *2/22, 2/30;* **B22D** *25/04;* **B23K** *1/12*

U.S. Cl. 164—80 **2 Claims**

1. An improved method for molecular fusion bonding of a battery post to an intercell connector in a lead-acid motive-power battery comprising the steps of:

a. positioning the battery with the lead battery post extending vertically upward through the battery cover along a work axis;

b. positioning a lead intercell connector in coaxial surrounding relation to the lead battery post;

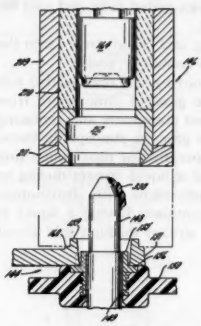
c. applying a chloride-salt flux to at least one of the lead battery post and lead intercell connector;

d. positioning a bonding head having a ram and a coaxial barrel over the battery with the ram disposed on the work axis;

e. moving the ram and barrel into engagement with the battery post and intercell connector, respectively;

f. heating the ram to a temperature sufficient to convert the lead components in the path of ram movement to the molten state;

g. moving the heated ram through the barrel and axially through the battery post and intercell connector with the ram following the post downwardly as the latter melts and displacing the molten lead thus formed upwardly into the barrel in surrounding relation with the ram;



h. retracting the ram from engagement with the unmelted lead components and the molten lead;

i. returning the molten lead theretofore displaced into the barrel back to the area of ram penetration into the battery post and intercell connector where such molten lead is permitted to cool and solidify;

j. retracting the barrel from the intercell connector upon cooling and solidification of the molten lead.

3,908,739

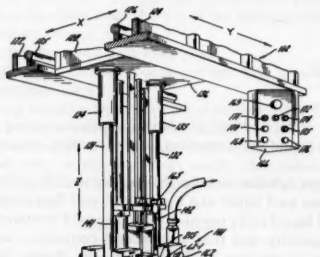
POSITIVE DISPLACEMENT CASTING

Robert Holbrook Cushman, Shrewsbury, N.J., assignor to Gould Inc., St. Paul, Minn.

Filed Jan. 21, 1974, Ser. No. 435,157

Int. Cl.[2] H01M *2/22, 2/30;* **B23K** *1/12;* **B22D** *19/00*

U.S. Cl. 164—80 **29 Claims**



1. A method of casting meltable material comprising the steps of

a. moving a ram relative to the material so as to cause the ram to engage the material;

b. establishing a reservoir surrounding the ram and engaged with the material to be cast;

c. heating the ram to a temperature sufficient to convert the meltable material in the path of relative ram movement to the molten state;

d. moving the heated ram relative to the material and through the reservoir so as to cause the ram to melt the material in its path of relative movement to a desired depth in the material with the molten material thus formed being positively displaced by the ram from the area of ram penetration into the material and shifted therefrom into the reservoir;

e. retracting the ram relative to the material from its position of maximum penetration so as to cause the ram to be withdrawn from the material; and,

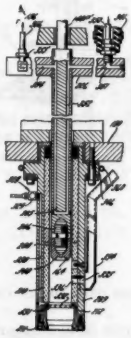
f. returning the molten material theretofore displaced into the reservoir back to the region penetration into the meltable material where such molten material is permitted to cool and solidify.

3,908,740

MINIMIZING OXIDATION IN POSITIVE DISPLACEMENT CASTING

Raymond L. Schenk, Jr., Doylestown, and Alan S. Keizer, Huntingdon Valley, both of Pa., assignors to Gould Inc., St. Paul, Minn.

Filed Jan. 21, 1974, Ser. No. 435,160
Int. Cl.² B23K *3/04*
U.S. Cl. 164—80 **14 Claims**



1. An improved method for molecular fusion bonding of *n* (where *n* equals two or more) lead components comprising the steps of:

a. positioning the *n* lead components on a work axis;

b. applying a reducing agent to at least one of the lead components;

c. positioning a bonding head having a ram and a coaxial barrel over the lead components with the ram disposed on the work axis;

d. moving the ram and barrel into engagement with the lead components;

e. heating the ram to a temperature sufficient to convert the lead components in the path of ram movement to the molten state;

f. moving the heated ram through the barrel and axially through the lead components as those portions of the latter within the path of ram movement melt, and displacing the molten lead thus formed upwardly into the barrel in surrounding relation with the ram;

g. retracting the ram from engagement with the unmelted lead components and the molten lead;

h. returning the molten lead theretofore displaced into the barrel back to the area of ram penetration into the lead components where such molten lead is permitted to cool and solidify; and,

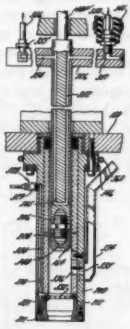
i. retracting the barrel from the lead components upon cooling and solidification of the molten lead.

3,908,741

METHOD FOR MINIMIZING OXIDATION IN POSITIVE DISPLACEMENT CASTING

Alan S. Keizer, Huntingdon Valley, Pa., assignor to Gould Inc., St. Paul, Minn.

Filed Jan. 21, 1974, Ser. No. 435,179
Int. Cl.² B22D *25/04;* **B23K** *11/00*
U.S. Cl. 164—80 **10 Claims**



1. A method of casting meltable material comprising the steps of:

a. moving a ram relative to the material so as to cause the ram to engage the material;

b. establishing a reservoir surrounding the ram and engaged with the material to be cast;

c. introducing a forming gas into the reservoir for the purpose of combining with and neutralizing oxidizing agents in the region of the material to be cast;

d. heating the ram to a temperature sufficient to convert the meltable material in the path of relative ram movement to the molten state;

e. moving the heated ram relative to the material and through the reservoir so as to cause the ram to melt the material in its path of relative movement and in the environment of the forming gas to a desired depth in the material with the molten material thus formed being displayed by the ram from the area of ram penetration into the material and shifted therefrom into the reservoir; and

f. retracting the ram relative to the material from its position of miximum penetration so as to cause the ram to be withdrawn from the material; whereupon the molten material theretofore displaced into the reservoir is returned back to the region of ram penetration into the meltable material where such molten material is permitted to cool and solidify.

3,908,742

APPARATUS FOR POSITIVE DISPLACEMENT BONDING

Raymond L. Schenk, Jr., Doylestown, Pa.; Robert Holbrook Cushman, Shrewsbury, N.J., and Alan S. Keizer, Huntingdon Valley, Pa., assignors to Gould Inc., St. Paul, Minn.

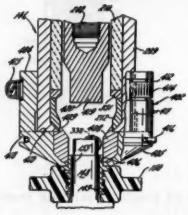
Filed Jan. 21, 1974, Ser. No. 435,180
Int. Cl.² H01M *2/22, 2/30;* **B22D** *19/00;* **B23K** *11/00*
U.S. Cl. 164—80 **5 Claims**

1. A method of bonding *n* (where *n* equals three or more) component parts together in a two-stage bonding operation comprising the steps of:

a. positioning *n—x* (where *x* equals at least two less than *n*) components parts on a work axis;

b. locating a bonding head over the *n—x* component parts with said bonding head having a ram disposed on the work axis and a barrel surrounding the ram;

c. positioning an adaptor assembly on the lower end of the barrel with the assembly defining an annular barrel extension having a smaller internal diamter than the barrel;
d. moving the ram, barrel and adaptor assembly into engagement with the *n—x* component parts;
e. heating the ram to a temperature sufficient to convert those portions of the *n—x* component parts in the path of relative ram movement to the molten state;
f. moving the heated ram through the barrel, adaptor assembly, and *n—x* components parts so as to cause the ram to melt the material in its path of relative movement to a desired depth in the *n—x* component parts with the molten material thus formed being displaced by the ram from the area of ram penetration into the material and shifted therefrom into the barrel;
g. retracting the ram from engagement with the *n—x* component parts from its position of maximum penetration so as to cause the ram to be withdrawn from such parts;



h. returning the molten material theretofore displaced into the barrel back to the area of ram penetration into the *n—x* component parts where such molten material is permitted to cool and solidify;
i. retracting the barrel;
j. removing the adaptor assembly from the barrel;
k. positioning said *x* component parts on said work axis in abutting relation to said *n—x* component parts;
l. advancing said barrel and said ram into engagement with said *n* component parts; and,
m. again heating, advancing and retracting said ram so as to melt those portions of said *x* component parts in the path of ram movement and to remelt those portions of the *n—x* component parts in the path of ram movement and to thereby bond said *x* and said *n—x* component parts together.

3,908,743

POSITIVE DISPLACEMENT CASTING SYSTEM EMPLOYING SHAPED ELECTRODE FOR EFFECTING COSMETICALLY PERFECT BONDS

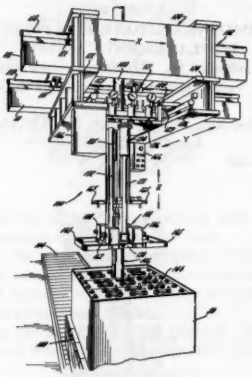
Raymond L. Schenk, Jr., Doylestown, Pa., and John A. Bruzas, Trenton, N.J., assignors to Gould Inc., St. Paul, Minn.

Filed Jan. 21, 1974, Ser. No. 435,181

Int. Cl.[2] H01M *2/22, 2/30;* **B22D** *19/00;* **B23K** *1/12*

U.S. Cl. 164—80 **6 Claims**

1. An improved method for molecular fusion bonding of a battery post to an intercell connector in a lead-acid motive-power battery comprising the steps of:
a. positioning the battery with the lead battery post extending vertically upward through the battery cover along a work axis;
b. positioning a lead intercell connector in coaxial surrounding relation to the lead battery post;
c. positioning a bonding head having a ram and a coaxial barrel over the battery with the ram disposed on the work axis;
d. forming an annular depending rib surrounding a work receiving recess on the work-engaging face of the end of the ram;
e. moving the ram and barrel into engagement with the battery post and intercell connector, respectively;
f. heating the ram to a temperature sufficient to convert the lead components in the path of ram movement to the molten state;
g. moving the heated ram through the barrel and axially through the battery post and the inner peripheral edge of the intercell connector with the annular work-engaging surface on the ram following the post downwardly as the latter melts and displacing the molten lead thus formed



upwardly into the barrel in surrounding relation with the ram;
h. retracting the ram from engagement with the unmelted lead components and the molten lead;
i. returning the molten lead theretofore displaced into the barrel back to the area of ram penetration into the battery post and intercell connector where such molten lead is permitted to cool and solidify;
j. retracting the barrel from the intercell connector upon cooling and solidification of the molten lead.

3,908,744

METHOD OF CONTINUOUSLY CASTING WIDE SLABS, IN PARTICULAR SLABS WIDER THAN 1000 MM

Thorwald Fastner, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Aug. 10, 1973, Ser. No. 387,371

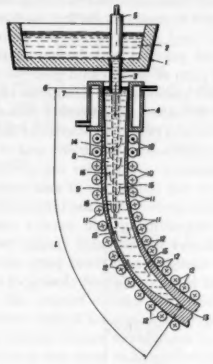
Claims priority, application Austria, Aug. 10, 1972, 6910/72

Int. Cl.[2] B22D *11/10*

U.S. Cl. 164—82 **7 Claims**

1. In a method of continuously casting wide slabs, particularly slabs having a width of more than 1000 mm, from steels, particularly from steels tending to segregate, in which a stream of molten steel is cast into a vertical, water-cooled mold to form a cast strand and said cast strand having a liquid core of a certain length and a solidified skin layer is withdrawn from the mold, the improvement comprising that the stream of molten steel vertically penetrates into the liquid core and is, in dependence upon the length (L) of the liquid core, cast at a velocity (*v*) kept at a value higher than a lower limit value

that increases with increasing length of the liquid core and that lies within 60 to 110 cm/sec for lengths (L) of from 8 to



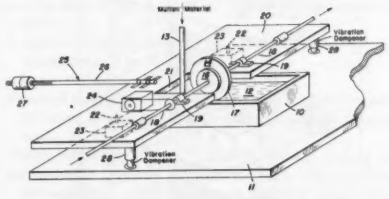
15 m, the range of lower limit values being represented by curve C in FIG. 2.

3,908,745

METHOD AND MEANS FOR PRODUCING FILAMENTS OF UNIFORM CONFIGURATION

Thomas W. Caldwell, Hightstown, and Richard A. Garini, Howell Twp., both of N.J., assignors to NL Industries, Inc., New York, N.Y.

Filed June 21, 1974, Ser. No. 481,496
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—87 **10 Claims**



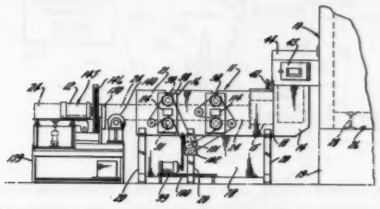
1. In a process for producing filaments of substantially uniform configuration from a bath of molten material solid at ambient temperature wherein the periphery of a rotating disc is immersed in said molten bath and a temperature gradient is maintained between the periphery of the disc and the molten bath such that material is solidified on the peripheral portion of said disc immersed in said bath to form a filament thereon substantially equal in length to the immersed peripheral portion of said disc, which filament is thereafter removed therefrom the improvement comprising: forming filaments of consistently uniform configuration by immersing said disc in said molten bath to a predetermined depth, rotating said disc in said bath to continuously form and remove filaments therefrom and automatically maintaining the depth of immersion of said disc in said bath substantially constant, continuously, concomitantly with a change in the level of the bath by adjusting the effective density of said rotating disc such that said disc is suspended in said bath at predetermined depth by the buoyancy thereof.

3,908,746

CONTINUOUS CASTING MACHINE

Richard D. Follrath; Charles W. Martin, both of Greenville; Russell L. Race, Ada, and Gerald McPherson, Greenville, all of Mich., assignors to Clark Automation, Inc., Belding, Mich.

Filed Mar. 30, 1973, Ser. No. 346,305
Int. Cl. B22d *11/12*
U.S. Cl. 164—152 **18 Claims**



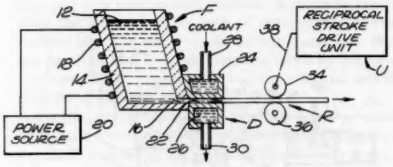
7. A continuous metal casting machine comprising a furnace for melting metal to a molten state, a holding box for receiving molten metal from said furnace, a casting mold having cylindrical outer periphery and an internal horizontally directed casting surface extending through said mold and communicating with said holding box, means for directing water uniformly about the outer periphery of said mold for cooling said mold and molten metal therein to continuously form and cast a metal ingot, drive means for moving said continuously cast ingot in a downstream direction away from said mold as it emerges from said mold, means for sensing an accidental bleed-out of metal from the downstream end of said mold, said sensing means including a rotatable gate mounted in a normally close relation to the downstream end of said mold and having an opening therein that is greater than outer dimensions of the merging cast ingot by a predetermined amount, and said gate being rotatable in an outward direction in the event that metal emerging from said mold engages said gate, and limit switch means being actuated in response to said outward rotary movement of said gate to automatically shut off the operation of said drive means.

17. A continuous metal casting machine comprising a furnace for melting metal to a molten state, a holding box for receiving molten metal from said furnace, a casting mold having an internal horizontally directed casting surface extending through said mold and communicating with said holding box, means for directing water onto the outer periphery of said mold for cooling said mold and the molten metal contained therein to continuously form and cast a metal ingot, a plurality of rotatable and axially movable rollers for engaging opposite sides of a cast ingot as it emerges from said mold to move said ingot in a downstream direction, power means for rotatably driving said rollers, means for automatically adjusting the axial position of said rollers to compensate for variations in the diameter of said ingot and to adjust the driving pressures of said rollers against said ingot, a saw positioned downstream of said rollers, means for sensing when a predetermined length of said ingot has moved past said saw, clamping means for engaging said ingot to move said saw in a downstream direction with said ingot upon triggering of said sensing means, means for laterally advancing said saw to cut said ingot to a predetermined length as said saw is moving in a downstream direction with said ingot, a table for receiving and supporting the cut-off length of said ingot upon completion of cutting by said saw, means for automatically tilting said table after an ingot length has been cut by said saw to remove said ingot length from said table, means for returning said saw to its original upstream and laterally retracted position upon completion of cutting of said ingot length, and means for returning said table to its original position for receiving another ingot length.

3,908,747
CONTROL SYSTEM FOR CONTINUOUS-CASTING DRIVE UNIT

Ralph Kuttner, Fullerton, Calif., assignor to Stoody Company, Santa Fe Springs, Calif.

Filed July 23, 1973, Ser. No. 381,964
Int. Cl.[2] B22D *11/08, 11/12*
U.S. Cl. 164—154 **4 Claims**



1. A control system, as for use with a continuous casting apparatus wherein molten metal is provided in a casting cavity to be cooled in exiting therefrom for movement in an externally-solidified continuous-length form from said casting cavity, comprising:

bidirectional actuating means including means for engaging said continuous-length form, for moving said form both toward and away from said casting cavity for the progressive development thereof, said actuating means being responsive to variations of a control signal waveform, with respect to a reference level indicative of a stationary state;

a variable signal generator means for providing a first electrical pulse;

means for shaping said first electrical pulse in relation to a solidification characteristic of said molten metal to provide a first control signal component;

means for applying said first control signal component to said actuating means as said control signal to move said form away from said casting cavity;

means for providing a second control signal component of opposed polarity to said first control signal component, and proportionately related to said first control signal component on the basis of time and amplitude; and

means for applying said second control signal component to said actuating means along with said first control signal component, to move said form toward said casting cavity.

3,908,748
DEVICE FOR AUTOMATICALLY CASTING OF MOLTEN MATERIAL

Alois Noisser, Bergfeld 2, A-2362 Biedermannsdorf, and Gerhard Nowak, Hauffgasse 8, A-1110 Vienna, both of Austria

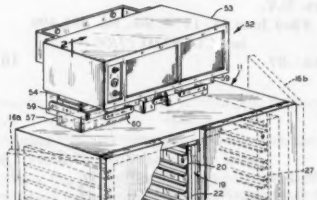
Filed Apr. 4, 1973, Ser. No. 347,827
Claims priority, application Austria, Apr. 7, 1972, 3040/72
Int. Cl.[2] B22D *5/04*
U.S. Cl. 164—329 **9 Claims**

1. A device for automatically casting of molten material, comprising at least two carrier means, each of which carries at least one permanent mold, each mold having at least two mold parts, and a transport mechanism having guideways, wherein the molten material is supplied in successive steps to said molds, each of which carrier means is slidably guided along said guideways of said transport mechanism in a closed path of travel, a pouring station for filling each mold with molten material, and at least one further station, at which the mold is discharged and prepared for the pouring operation following next, said pouring and further stations being arranged along said path of travel, said guideways passing said pouring and further stations, and comprise two sections arranged one above the other, said pouring station being passed by the lower one of said guideway sections, and further comprise a lifting device, provided at the one end of said guideway sections for transmitting said carrier means from said lower guideway section to the upper one of said guideway sections and a lowering device provided at the other end of said guideway sections for transmitting said carrier means from the upper one to the lower section, said carrier means having at least one arm for carrying said mold parts movable with respect to each other for opening and closing of said mold, said arm protruding from the carrier means, all carrier means forming interchangeable units, and further comprising means for removing any of said carrier means together with its mold parts from said guideways at at least one point of said closed path of travel.

3,908,749
FOOD SERVICE SYSTEM

Leslie G. Williams, Murfreesboro, Tenn., assignor to Standex International Corporation, Murfreesboro, Tenn.

Filed Mar. 7, 1974, Ser. No. 449,034
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—2 **12 Claims**



5. Apparatus for transporting to and for serving meals comprising both hot and cold foods at a location remote from the location at which the food is prepared, said apparatus comprising,

a. a plurality of identical individual meal service trays having areas thereon for cold foods,

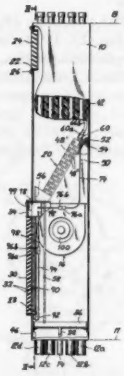
b. a plurality of identical individual meal heat retaining hot food storage and serving units placed on said trays,

c. each of said units having a heatable element capable of retaining heat for a substantial period of time, a jacket around said element, a food surface and a dome-shaped insulating cover,

d. an insulated cabinet having interior rack means for carrying a plurality of said trays with said units thereon from the food preparing location to the food serving location,

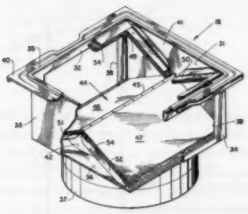
e. input and exhaust air flow ducts on said cabinet, and
f. a chilled air supply unit having output and return air ducts and means for coupling said output and input ducts and said exhaust and return ducts for circulating chilled air through said cabinet and exteriorly about said hot food storage units and said cold food areas in said individual trays.

3,908,750
HEATING AND COOLING APPARATUS
Sidney Siegel, 989 Schenectady Ave., Brooklyn, N.Y. 11203
Filed Mar. 4, 1974, Ser. No. 447,784
Int. Cl.[2] F25B *29/00*
U.S. Cl. 165—26 **7 Claims**



1. An apparatus for heating and/or cooling air comprising: at least two feed riser pipes; p1 an upright vertically elongated housing formed with upper and lower openings;
a drip pan in the bottom of said housing connected to a drain;
a heat-exchanger assembly in said housing between said openings and including
a heat-exchanger coil,
a pair of conduits between said coil and said feed pipes and adapted to conduct liquid from said pipes through said coil,
means releasably connecting said conduits to said pipes,
thermostatic control means for regulating liquid flow through said coil according to ambient temperature,
an electric blower below said coil for drawing air in through said lower opening and passing said air through said coil and out said upper opening,
means releasably securing said blower to said coil,
means for conducting condensate from said coil to said drip pan, and
means for releasably connecting said blower to a source of electric power;
hanger means for removably suspending said assembly in its entirety in said housing between said openings, said hanger means including an upwardly directed lip provided on said housing between said opening and a downwardly directed lip provided on said assembly, said lip on said assembly engaging over said lip on said housing, said coil being arranged at an angle to the vertical and having a pair of sheet-metal sides, said blower being suspended from said sides and said downwardly directed lip extending between said sides, said blower being a radial-input axial-output blower having its axial output directed upwardly through said coil; and
motor control means on said blower and removable therewith said motor control means being aligned with an opening in said housing for manipulation therethrough when said blower is suspended from said coil.

3,908,751
DUCT SYSTEM FOR MOBILE HOME
Walter R. Sheppard, Jr., P.O. Box 797, Fletcher, N.C. 28732
Filed May 21, 1973, Ser. No. 362,215
Int. Cl. F24f *3/02*
U.S. Cl. 165—27 **5 Claims**

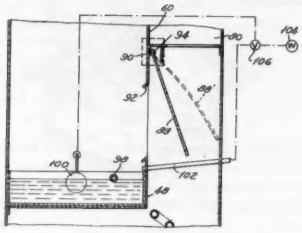


1. A heating and air conditioning system for a mobile home or the like comprising a system of air ducts extending about the mobile home and communicating with the mobile home interior, a furnace in the mobile home and including a hot air exhaust, an air conditioning unit including a cold air exhaust, a plenum chamber defining a hot air inlet opening in one wall portion in communication with the hot air exhaust of said furnace, a cold air inlet opening in another wall portion in communication with the cold air exhaust of said air conditioning unit, and at least one outlet opening in another wall portion in communication with said system of air ducts, and valve means including a movable valve plate constructed and arranged to move toward and close the hot air inlet opening in response to the flow of air from the cold air exhaust of said air conditioning unit against said valve plate and to divert the air from its direction flowing from the cold air exhaust toward said outlet opening or to move toward and close the cold air inlet opening of said plenum chamber in response to the flow of air from the hot air exhaust of said furnace against said valve plate and to divert the air from its direction flowing from the hot air exhaust toward said outlet opening, so that air flowing from the cold air exhaust of the air conditioning unit will not flow through the furnace and air flowing from the hot air exhaust of the furnace will not flow through the air conditioning unit.

3,908,752
VERTICAL BLOWER COIL UNIT FOR HEATING AND COOLING
William R. Padden, 13823 Heritage Dr., Riverview, Mich. 48192
Filed Aug. 16, 1973, Ser. No. 388,898
Int. Cl.[2] G05D *23/00;* **F16K** *1/16*
U.S. Cl. 165—35 **17 Claims**

7. An apparatus for conditioning air comprising a cabinet, an air inlet in the lower portion of the cabinet and an air outlet in the upper portion thereof, a pair of passageways in said cabinet between said air inlet and said air outlet, heat transfer coil means for the passage of liquid of preselected temperature mounted in one of said passageways, first means to flow a liquid through said coil means, second means for directing a flow of air from said air inlet to said air outlet, a pivotally mounted damper element in said cabinet pivotable to positions blocking one or the other of said passageways while permitting free flow of air through the unblocked passageway, a reversible electric damper motor connected to said damper element for pivoting of same, control means to energize said air flow directing means and said damper motor in response to temperature requirements of the area being served, said

control means in response to a first temperature requirement being operative to energize the damper motor to pivot the damper element to a position opening the passageway in which said heat transfer coil means is positioned and block the other passageway, said control means in response to a second temperature requirement being operative to energize the damper motor to pivot the damper element to close the passageway in which said heat transfer coil means is positioned to prevent the flow of air over the heat transfer coil means at that time and open the other passageway to permit the flow of air



therethrough to said air outlet, structures in said cabinet on both sides of the damper element for abutment of the damper element when pivoted thereagainst by said damper motor, said damper element being fabricated of a flexible material, the angle of travel of the damper element between the structures against which it may abut being less than the angle through which the damper motor drives upon energization in either direction, the flexible nature of the damper element permitting such overdrive as the result of deformation of the damper element after abutment whereby positive blocking of one or the other of the passageways is accomplished.

3,908,753

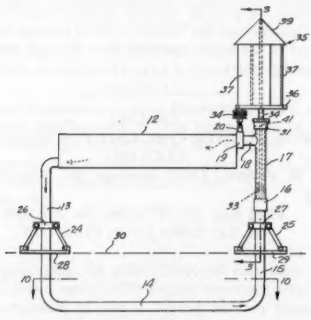
FREEZING-WARMING APPARATUS

Joseph C. Balch, Mile 34, Salcha, Fairbanks, Alaska 99701

Filed Apr. 19, 1974, Ser. No. 462,422

Int. Cl.[2] F28D *15/00*

U.S. Cl. 165—39 **13 Claims**



1. A heat transfer device for conveying heat between the ambient atmosphere and a sub-surface region comprising an elongated bottom heat-conducting conduit member disposed in said sub-surface region, an elongated top heatconducting container exposed to the ambient atmosphere and having depending conduits at its opposite ends, said conduits extending downwardly and being connected to the respective opposite ends of said bottom conduit member, forming a closed-circuit circulation cell, a liquid heat-transfer medium in said closed-circuit circulation cell and filling said cell sufficiently to allow circulatory convection flow through said closedcircuit cell responsive to exposure of said top heat-conducting container to temperatures lower than that of the subsurface region containing said bottom conduit member, propeller means rotatably mounted in a portion of said closed-circuit cell for forcing circulation, drive means mounted on the cell and being drivingly connected to said propeller means, and temperature-responsive mechanical detent means mounted on the cell in a position exposed to the ambient temperature and being at times lockingly engageable with said drive means so as to control said drive means in accordance with the ambient temperature.

3,908,754

ROTATING HEAT EXCHANGER

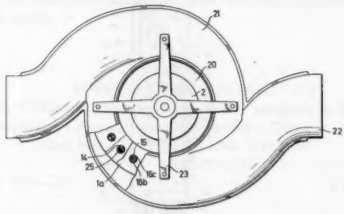
Nikolaus Laing, Hofener Weg 35 bis 37, 7141 Aldingen, near Stuttgart, Germany

Division of Ser. No. 293,100, Sept. 28, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 435,644

Claims priority, application Austria, Oct. 7, 1971, 8657/71

Int. Cl. F28d *11/04*

U.S. Cl. 165—86 **2 Claims**



1. A rotary heat exchanger comprising a rotatable matrix of axially spaced sheet metal elements of good thermal conductivity arranged to afford radial passage of air between said elements, at least one L-shaped outer pipe having an axially extending portion closed at one axial end thereof and transversing said sheet metal elements in good thermal contact therewith, a radially extending portion connected at its radial outer end to the end of the axially extending portion opposite said closed end, a first fluid collector space connecting with the radial inner end of the outer pipe, an inner L-shaped pipe having a smaller outer diameter than the inner diameter of the outer pipe positioned within the outer pipe wherein the inner pipe forms one flow channel and the spapce between the inner pipe and the outer pipe forms another flow channel and wherein the outer pipe extends at its closed end axially beyond the inner pipe to form an axially extending space between the closed end and the end of said inner pipe to provide a fluid connection between the flow channels, and a second fluid collector space connecting with the radial inner end of the inner pipe.

3,908,755

SAFETY SYSTEM FOR PRESSURIZED VESSELS

Robert J. Sukenik, Bloomfield Hills, Mich., assignor to New Hudson Corporation, New Hudson, Mich.

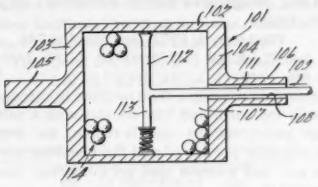
Filed Aug. 8, 1973, Ser. No. 386,841

Int. Cl.[2] F28F *5/02*

U.S. Cl. 165—89 **11 Claims**

1. In combination with a closed pressurized steam heated roll type vessel having a predetermined volume and means for the introduction of pressurized gas into said vessel, the improvement comprising a loose filler material occupying most of said predetermined volume, said filler material being made up of particles with the volume of each particle having a relatively low average density, the total weight of each particle being less than that which would cause serious bodily injury when traveling at high velocity, whereby upon failure of said

pressurized vessel said particles will not become dangerous projectiles, each particle being independently movable with



respect to the others and with respect to the interior surfaces of said vessel.

3,908,756

TUBE-IN-SHELL HEAT EXCHANGERS

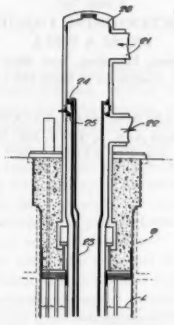
John Richardson, Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 29, 1974, Ser. No. 456,265

Claims priority, application United Kingdom, Apr. 16, 1973, 18312/73

Int. Cl. F28f *9/02*

U.S. Cl. 165—158 **5 Claims**



1. A tube-in-shell heat exchanger comprising,

a bundle of parallel heat exchange tubes within a shell and having their ends received in a pair of longitudinal spaced cylindrical tube sheets,

a tube member disposed on the longitudinal axis of the bundle of tubes, the tube member incorporating the spaced tube sheets and having a closed end,

a demountable tubular baffle disposed within the tube member and sealed thereto between the tube sheets to define discrete co-axial fluid flow ducts interconnected at the closed end region of the tubular member by the heat exchange tubes.

3,908,757

GASKETS FOR PLATE HEAT EXCHANGERS

Felix William Wright, nr. Crawley, England, assignor to The A.P.V. Company Limited, Crawley, England

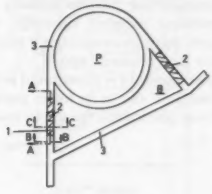
Filed Aug. 8, 1974, Ser. No. 495,573

Claims priority, application United Kingdom, Aug. 16, 1973, 38786/73

Int. Cl.² F28F *3/08*

U.S. Cl. 165—167 **9 Claims**

1. A sealing arrangement for a heat exchanger plate having port apertures, a flow space zone and bridge zones between selected port apertures and the flow space zone, the bridge zones being isolated in use by the sealing arrangement from other respective port apertures and the flow space zone and being vented, the sealing arrangement comprising a peripheral gasket portion surrounding the flow space zone, a gasket portion surrounding each port aperture isolated from the flow



space zone, and linking gasket portions between the peripheral gasket portion and the port aperture gasket portions, the said linkage portions having vent gaps and being formed, in the region of the said vent gaps, of a material harder than the material used for the sealing gasket portions whereby extrusion into the vent gaps is prevented.

3,908,758

HEATING OR COOLING RADIATOR

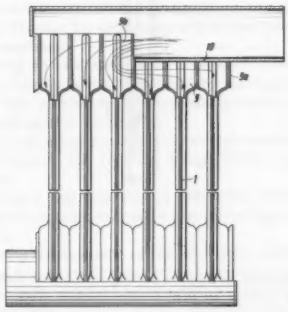
Erich Armonies; Horst Keiner, and Herbert Steup, all of Bad-Marienberg, Germany, assignors to Menk Apparatebau GmbH, Bad-Marienberg, Germany

Filed Dec. 1, 1972, Ser. No. 311,403

Claims priority, application Germany, Dec. 8, 1971, 2160865; Aug. 26, 1972, 2242159

Int. Cl.² F28F *9/02*

U.S. Cl. 165—174 **5 Claims**



1. A radiator assembly for the circulation therethrough of a heat transfer fluid such as the cooling oil of a transformer, for example, the assembly comprising:

a generally horizontally oriented inlet manifold having a closed end on one side and an inlet opening on its opposite side connectable to a fluid circulating system;

a generally similarly oriented outlet manifold spaced a distance below the inlet manifold and having likewise a closed end on one side and an outlet opening on the opposite side connectable to said fluid circulating system; a plurality of hollow radiator members extending generally vertically and at regular intervals between the two manifolds, each radiator member including upper and lower openings for communication with both manifolds; and wherein

at least the inlet manifold has its length subdivided into first and second length portions, the latter encompassing corresponding first and second groups of upper radiator member openings, respectively;

the first manifold length portion has its flow section longitudinally subdivided into an upper flow channel leading from the inlet opening of the manifold directly to its second length portion, and a lower flow channel leading from the second manifold length portion to said first group of radiator member openings, thereby forcing the entire incoming fluid flow to initially bypass the first group of radiator member openings, the latter being reachable only through reversal of a portion of said flow, via the lower flow channel; and

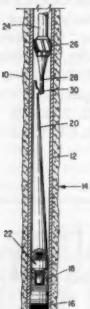
at least said inlet manifold is constituted in its upper portion by a manifold pipe and in its lower portion by adjoining enlarged throat portions at the upper ends of the radiator members.

3,908,759

SIDETRACKING TOOL

William S. Cagle, Tulsa, Okla., and Fred H. Dillard, Lake Charles, La., assignors to Standard Oil Company, Chicago, Ill.

Filed May 22, 1974, Ser. No. 472,316
Int. Cl.² E21B *7/08*
U.S. Cl. 166—117.6 **3 Claims**



1. A downhole device for setting in a cased wellbore, from which it is desired to drill a side-tracked well, which comprises:

an anchor means for anchoring in said cased borehole;

an anchor means extension extending upwardly from said anchor means, and including latching means having:

a hollow cylindrical member having an internal latching groove near its upper end;

internal spline means on the internal surface of the said cylindrical member;

a cup-like member set in said cylindrical member;

a first shear pin holding said cup-like member to said cylindrical member;

a whipstock;

a whipstock extension including a lower cylindrical member for fitting into said cup-like member and an intermediate cylindrical portion above said lower portion and having external splines thereon, said external splines matching the internal splines of said cylindrical member of said anchor means extension when inserted therein;

latching dogs on said intermediate member of said whipstock extension for latching into said latching grooves of said anchor means' cylindrical member.

3,908,760

METHOD OF TREATING SUBTERRANEAN FORMATIONS WITH AQUEOUS GELS

Richard L. Clampitt, and James E. Hessert, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 9, 1973, Ser. No. 404,746
Int. Cl.² E21B *33/138, 43/22, 43/26, 21/04*
U.S. Cl. 166—246 **18 Claims**

1. In a method wherein a fluid medium is introduced into a borehole in the earth and into contact with a subterranean formation penetrated by said borehole, the improvement wherein at least a portion of said fluid medium comprises an aqueous gel, and wherein said gel comprises water having incorporated therein:

a water thickening amount of a water-soluble biopolysaccharide produced by the action of bacteria of the genus Xanthomonas on a carbohydrate;

an amount of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower polyvalent valence state and which amount is sufficient to cause gelation of said water when the valence of at least a portion of said metal is reduced to said lower valence sate; and

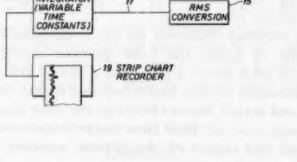
an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state.

3,908,761

METHOD FOR DETERMINING LIQUID PRODUCTION FROM A WELL

Maurice M. Patterson, Houston, and Bass C. Sheffield, Bellaire, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 356,650, May 2, 1973, Pat. No. 3,834,227.
This application Aug. 5, 1974, Ser. No. 494,581
Int. Cl.² E21B *47/00*
U.S. Cl. 166—250 **3 Claims**



1. A method for controlling the operation of an artificially lifted oil well comprising:

measuring at the surface fluctuations in the pressure of the fluid flow from the well;

measuring the RMS value of the fluctuations;

integrating the RMS signal occurring in a predetermined time period to obtain a signal related to the liquid flow from the well;

comparing said integrated signal with a pre-set signal representing the desired liquid flow from the well over the time period to obtain an error signal; and

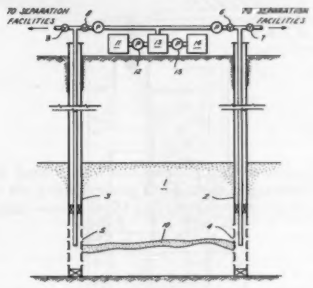
controlling the aritificial lift means in response to said error signal.

3,908,762

METHOD FOR ESTABLISHING COMMUNICATION PATH IN VISCOUS PETROLEUM-CONTAINING FORMATIONS INCLUDING TAR SAND DEPOSITS FOR USE IN OIL RECOVERY OPERATIONS

David Arthur Redford, Fort Saskatchewan, Canada, assignor to Texaco Exploration Canada Ltd., Canada

Filed Sept. 27, 1973, Ser. No. 401,529
Int. Cl.² E21B *43/24*, *43/26*
U.S. Cl. 166—263 13 Claims



1. In a method of recovering viscous petroleum including bitumen from a subterranean, viscous petroleum-containing formation including a tar sand deposit, said formation being penetrated by at least one injection well and by at least one production well, said recovery method being of the type wherein a fluid is injected into the injection well for the purpose of increasing the mobility of the petroleum contained in the formation, the improvement for creating a permeable, stable, fluid communication path between the injection well and production well which comprises:

a. fracturing the formation adjacent to at least one of the wells by hydraulic fracturing and injecting into the fractured zone a propping agent to establish a permeable, propped fracture zone extending at least a portion of the way into the tar sand deposit toward the other well;

b. injecting steam and a gas selected from the group consisting of methane, ethane, propane and butane into the propped fractured zone via the well adjacent thereto at a preselected pressure; and

c. recovering bitumen, steam and steam condensate from at least one of said wells.

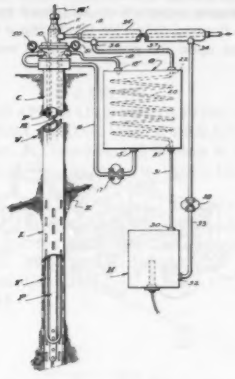
3,908,763

METHOD FOR PUMPIN PARAFFINE BASE CRUDE OIL

Drexel W. Chapman, 15717 S. Woodruff Ave., Space No. 46, Bellflower, Calif. 90706

Filed Feb. 21, 1974, Ser. No. 444,564
Int. Cl.² E21B *43/24*, *37/00*
U.S. Cl. 166—302 7 Claims

1. The method for maintaining continuous, uniform, free flow of paraffine ladened crude oil in a well structure including an elongate vertical well bore extending downwardly from ground level to a production zone, a casing in the bore, a production tubing extending freely through the casing, a pump related to the lower end of the tubing and heating means at upper end of and extending through the well structure, said method comprising heating and maintaining the well structure and paraffine ladened crude oil therein at a temperature above that chill temperature at which the paraffine in the crude oil separates from the crude oil and solidifies, within that temperature range in which the paraffine is and remains dissolved in the crude oil, below the melting temperature of



the paraffine and below the fracturing temperature at which the paraffine separates from the crude oil.

3,908,764

METHOD OF TREATING PETROLEUM-BEARING FORMATIONS FOR SUPPLEMENTAL OIL RECOVERY

Robert R. Harvey, Pueblo, Colo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 25, 1974, Ser. No. 526,938
Int. Cl.² E21B *43/22*, *43/24*
U.S. Cl. 166—305 R 7 Claims

1. A method of treating petroleum-bearing formations with an aqueous solution of salt-sensitive polymer to control mobility in the formation for secondary and tertiary recovery, said method comprising:

a. selecting as said salt-sensitive polymer, compounds of which the viscosity is decreased by increasing the inorganic salt concentration in aqueous solutions containing such salt-sensitive polymers;

b. forming an aqueous mixture of said salt-sensitive polymer and inorganic salt to form a high brine concentration mixture;

c. injecting a first injection of said brine mixture into a petroleum-bearing formation containing high brine water therein;

d. following the injection of said high brine mixture with a second injection of a high brine aqueous solution;

e. following the second injection with a third injection of an aqueous brine solution weaker than said high brine mixture and high brine aqueous solution thereby decreasing the salt concentration in the petroleum-bearing formation by admixing with the first and second injections for improving mobility within said petroleum-bearing formation; and

f. injecting a driving fluid into said formation after said third injection.

3,908,765

FLOATING POSITION PROPORTIONAL CONTROL SYSTEM

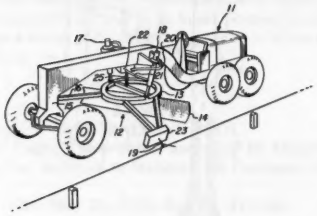
Royal R. Hawkins, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 1, 1973, Ser. No. 337,228
Int. Cl.² E02F *3/76*
U.S. Cl. 172—4.5 10 Claims

1. In a system for positioning the working tool of a road working machine with respect to a predetermined reference, said machine comprising a machine frame and a blade circle support frame, said system comprising:

sensor means mounted on said road working machine for producing a sensor signal indicative of the deviation of said working tool from the predetermined reference;

feedback means mounted on said road working machine having a floating range for producing a feedback signal dependent upon the position of said working tool with



respect to said machine, said floating range having a limited proportional range and an integral range;

means connected to said sensor means and said feedback means for providing an output signal dependent upon said sensor signal and said feedback signals; and,

position control means for controlling the position of said working tool dependent upon said output signal.

3,908,766

IMPACT WRENCH

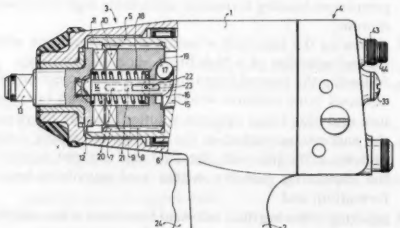
Johann Hess, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 26, 1974, Ser. No. 446,020

Claims priority, application Germany, May 23, 1973, 2326171

Int. Cl.² B25B *19/00*

U.S. Cl. 173—12 **13 Claims**



1. In a power tool, a combination comprising a fluid-actuated motor; means for supplying pressurized fluid to said motor; actuator means driven by said motor and generating a series of impacts; means for sensing the occurrence of each impact and for generating a pressure pulse in response thereto; and means for interrupting the supply of said pressurized fluid to said motor when a predetermined cumulative number of said pulses has been generated.

3,908,767

PERCUSSION TOOL

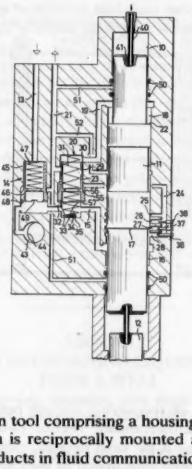
Gunter Klemm, Olpe, Germany, assignor to Fa. Ingenieur Gunter Klemm Spezialunternehmen fur Bohrtechnik, Olpe, Germany

Filed Sept. 4, 1974, Ser. No. 503,057

Claims priority, application Germany, June 11, 1974, 2428236

Int. Cl.² E21C *7/00;* **F01L** *25/04;* **F01B** *7/18*

U.S. Cl. 173—78 **20 Claims**



1. A percussion tool comprising a housing defining a chamber within which is reciprocally mounted a piston, first and second pressure ducts in fluid communication with said chamber at respective first and second sides thereof, a control duct in fluid communication with said chamber at said second side of said piston, a return duct in fluid communication with said chamber at a point intermediate the points of entry of said first and second pressure ducts relative to said chamber, an inlet duct for delivering a pressurized fluid to said pressure ducts, and movable valve means for alternately placing said inlet and pressure ducts in fluid communication in a first position of said valve means and placing said first pressure and return ducts in fluid communication in a second position of said valve means while at the same time maintaining fluid communication between said inlet and second pressure ducts and closing communication between said inlet and first pressure ducts, said valve means being an annular open ended valve sleeve mounted for reciprocal motion in a bore, said first and second pressure ducts open into said bore at axially opposite ends thereof, said return duct opens into said bore between the points of entry of said first and second pressure ducts relative to said bore, and said valve sleeve has first means on an outer peripheral surface thereof for placing said first pressure and return ducts in fluid communication in said second position.

3,908,768

ROTARY IMPACT TOOL

Johann Hess, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 12, 1974, Ser. No. 450,486

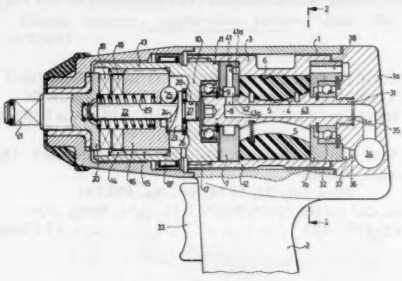
Claims priority, application Germany, Mar. 17, 1973, 2313402

Int. Cl.² E25D *15/00*

U.S. Cl. 173—93 **10 Claims**

1. In a rotary impact tool, especially an impact wrench, a combination comprising a tool housing; drive means in said housing and comprising a central stator and a tubular rotor surrounding said stator; a pot-shaped guide housing in said tool housing and connected to the rotor for rotation therewith, said pot-shaped guide housing having a bottom wall facing

said drive means and being rotatably supported on said central stator; a hammer arranged in said guide housing for reciprocating movement relative thereto; and cooperating means on



said guide housing and said hammer for connecting the hammer with the guide housing for rotation therewith while permitting axial movement of said hammer relative to said guide housing.

3,908,769

METHOD AND MEANS FOR CONTROLLING KICKS DURING OPERATIONS IN A BOREHOLE PENETRATING SUBSURFACE FORMATIONS

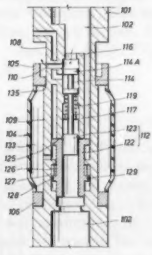
Willem Schuyf, The Hague; Bart Tent, Rijswijk; Philip W. Pattynama, Rijswijk, and Frans deKlerk, Rijswijk, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 6, 1973, Ser. No. 410,589

Claims priority, application United Kingdom, Jan. 4, 1973, 564/73; Sept. 10, 1973, 42472/73

Int. Cl.[2] E21B *33/127*

U.S. Cl. 175—48 **29 Claims**



1. Means for controlling kicks during operations in a bore hole penetrating subsurface formations, said means being adapted to be included between two portions of tubular bore hole equipment and comprising:

an elongated body member with a conduit longitudinally therethrough, and a first valve system arranged in this conduit for controlling the passage of fluid therethrough; an inflatable packer around the body member and comprising an elastic annular element connected at each end thereof to an annular sleeve arranged slidingly in axial direction on part of the outer wall of the elongate body member and sealing against the said outer wall; and

a second valve system to control fluid communication between the exterior of the body member and the conduit extending longitudinally through the body member and between the interior of the inflatable packer and the said conduit through the body member, said second valve system including one of the annular sleeves, means being provided for retaining said sleeve during inflation of the packer when supplying fluid to the interior thereof in a position in which it closes off the communication between the exterior of the body member and the conduit through the body member but allows communication between this conduit and the interior of the inflatable packer.

3,908,770

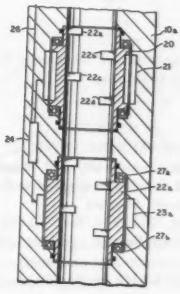
METHODS AND APPARATUS FOR DRIVING A MEANS IN A DRILL STRING WHILE DRILLING

Albert P. Richter, Jr., Houston, and William R. McEvers, Jr., Bellaire, both of Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 363,784, May 24, 1973, Pat. No. 3,837,233, and a continuation-in-part of Ser. No. 290,676, Aug. 20, 1972, Pat. No. 3,820,389. This application May 13, 1974, Ser. No. 469,147

Int. Cl.[2] E21C *7/08;* **E21B** *3/12*

U.S. Cl. 175—65 **2 Claims**



1. A method for driving a generator in the lower end of a drill string while drilling for powering a control system in the drill string comprising the steps of,

a. circulating drilling mud internally of the drill string from the drill string upper end to the drill string lower end,

b. rotating a vaned turbine wheel in the drill string by action of the downwardly circulating drilling mud, and

c. driving a generator in the drill string with the mud driven rotating vaned turbine wheel, and

d. generating electricity with said generator for powering the control system.

3,908,771

DRILL COLLAR INCORPORATING DEVICE FOR JETTING DRILLING FLUID TRANSVERSELY INTO BORE HOLE

Wylie P. Garrett, 1 W. Blackburn Rd., Ext., Hammond, La. 70401

Filed Mar. 1, 1974, Ser. No. 447,371

Int. Cl.[2] E21C *15/00*

U.S. Cl. 175—393 **12 Claims**

1. A drill collar structure for incorporation into a drill string for deep well rotary drilling comprising an elongated cylindrical collar member having an axially extending throughbore for passing a drilling fluid downwardly to the lower end of the drill string, said collar member including at least one slot forming a duct extending transversely through the wall thereof intermediate said throughbore and its periphery, opposite ends of said slot reaching to the surface of said collar member at corresponding locations on the periphery thereof, and at least one nozzle member located in a bore extending transversely

between said throughbore and said slot intermediate the ends of said slot for jetting drilling fluid diverted from said through-

bore into said slot and thence outwardly from the opposite ends thereof into the bore hole.

3,908,772

MEASURING DEVICE

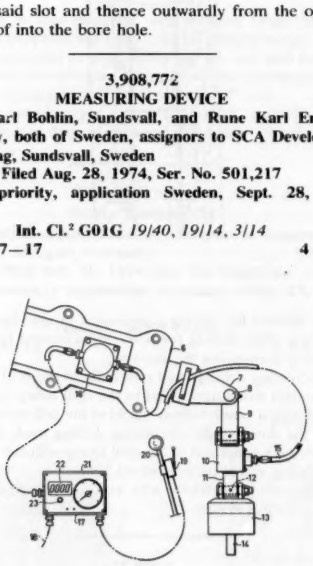
Gunnar Karl Bohlin, Sundsvall, and Rune Karl Eriksson, Kvissleby, both of Sweden, assignors to SCA Development Aktiebolag, Sundsvall, Sweden

Filed Aug. 28, 1974, Ser. No. 501,217

Claims priority, application Sweden, Sept. 28, 1973, 7313231

Int. Cl.[2] G01G *19/40, 19/14, 3/14*

U.S. Cl. 177—17 **4 Claims**



1. Apparatus for gathering measuring data obtained when weighing unit loads, the data obtained for each weighing being accumulated in a separate receiver means (**17**), which apparatus comprises

a load transmitter (**10**) including a hollow downwardly open frame (**1**) comprising vertical walls (**26**) and a substantially horizontal beam (**27**), said open frame (**1**) having formed therein an internal space (**2**);

a support (**3**) rigidly connected to frame (**1**) and disposed in said internal space (**2**),

said support (**3**) extending transversely across said space to form a passageway (**25**) for a load carrier (**4**) movable in said space (**2**) to the inner wall of frame (**1**);

said load carrier (**4**) enclosing said support (**3**), and

a pressure-sensitive member (**5**) borne on said support (**3**) which member, upon load application of the load carrier (**4**) is exposed to pressure between said support (**3**) and said horizontal beam (**27**) and delivers a measuring value for registration in the aforesaid receiver means (**17**)

the load transmitter being connected to an intermediate link (**9**) at the top by means of an axle (**31**) and at the bottom connected to a load carrier (**4**) by means of an axle (**32**).

3,908,773

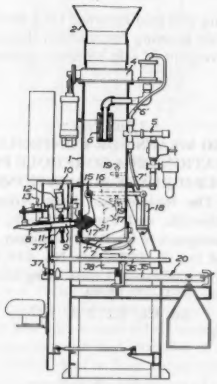
DEVICES FOR PROGRESSIVE THROTTLING TO COMPLETE SHUT-OFF OF THE DISCHARGE IN MACHINES FOR DISPENSING FLUIDIZABLE MATERIAL IN WEIGHT PORTIONS

Nils Asp, Svedala, Sweden, assignor to Svedala-Abra AB, Svedala, Sweden

Filed July 22, 1974, Ser. No. 490,741

Int. Cl.[2] G01G *13/02;* **B65B** *1/16, 1/34;* **B65G** *53/40*

U.S. Cl. 177—122 **12 Claims**



1. A bag filling machine for dispensing fluidizable material in weight portions, said machine comprising a tank for holding fluidizable material, means for fluidizing fluidizable material in said tank, a material outlet from said tank, said outlet comprising an outlet tube in communication with and projecting from said tank, a shut-off device for shutting off a stream of material fed from said tank through said tube, a bag supporting means for supporting a bag outside said tank and in communication with said tube, a weigher connected to said bag supporting means for weighing material discharged from the tank through said tube into a bag supported by said supporting means, said weigher comprising an operating mechanism connecting said weigher to said shut-off device and adapted to be operated by said weigher and to operate said shut-off device to close said outlet when a weight portion preset by means of the weigher has been fed into said bag, wherein the shut-off device comprises a plug movably mounted inside the tank and connected to said operating mechanism, said plug being movable by said operating mechanism for movement into and back from said material outlet between a retracted open position and a partially closed position in which the plug leaves only part of the cross sectional area of the material outlet open to permit a restricted discharge of material, said weigher being preset to operate said operating mechanism for moving said plug to said partially closed position before a full weight portion is attained in said bag and, consequently, before the operation of said shut-off device to close said outlet.

3,908,774
COUPLING MEANS FOR TRACTORS

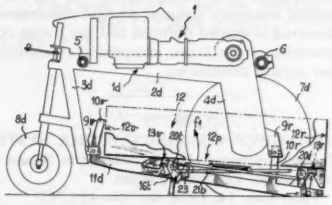
Emile Bobard, Beaune, France, assignor to Bobard Jeune, Beaune (Cote d'Or), France

Filed June 14, 1974, Ser. No. 479,586

Claims priority, application France, June 28, 1973, 73.23697

Int. Cl.² B60P *1/64*

U.S. Cl. 180—1 F **8 Claims**



1. An automotive device provided by coupling a piece of equipment to the sides of the chassis of a straddle tractor, the coupling means used being of the transverse-pin and lateral-slot type suitably mounted on the piece of equipment and on vertically adjustable elements on the tractor chassis, said tractor comprising: means for adjusting the distance between its sides while it is in motion, the slot pins projecting transversely into the straddle chassis, the coupling means including transverse sliding arrangements for said pins; means to shut off the straddle-chassis mechanism as soon as the reactions, applied transversely by the sides of the chassis to the piece of equipment coupled to the tractor, reach a predetermined value.

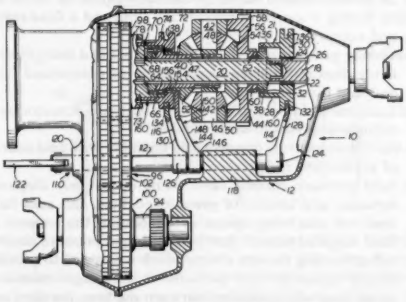
3,908,775
TRANSFER CASE ASSEMBLY WITH A DOUBLE DUTY DIFFERENTIAL

Frederick L. Van Fossen, Fort Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 533,060

Int. Cl.² B60K *17/34*

U.S. Cl. 180—44 R **9 Claims**



1. A transfer case assembly comprising a transfer case housing, an input shaft and two output shafts rotatably supported within said housing, a differential cross and a differential casing each rotatably supported within said housing, said differential cross including cross pin means, a pair of pinion gears and a pair of side gears disposed in said differential casing with said pinion gears each being rotatable on said pin means and with each of said pinion gears meshing with both of said side gears, gear locking means for selectively holding one of said side gears in a non-rotative relation to said housing and coupling means for selectively interconnecting said differential cross and housing to said three shafts for two modes of four-wheel drive operations, wherein one mode said coupling means connects: said cross pin to said input shaft, one of said side gears to one of said output shaft and the other of said side gears to the other of said output shafts, and wherein the other mode said gear locking means holds one of said side gears in a non-rotative position and said coupling means connects: the other of said side gears to said input shaft, said differential casing to one of said output shafts, and said cross pin to the other of said output shafts.

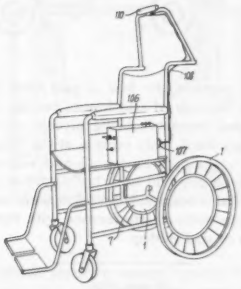
3,908,776
MOTORIZED WHEEL

Albert Edward Frederick Dudley, Aylesbury, England, assignor to Saunders & Dudley Limited, Aylesbury, England

Filed May 22, 1973, Ser. No. 362,760

Int. Cl.² B60K *7/00*

U.S. Cl. 180—65 F **3 Claims**



1. In an invalid carriage, a combination comprising frame means, a rotary wheel body mounted on said frame means and supporting a ground-engaging tire, an annular web extending from the outer peripheral region to the inner peripheral region of said wheel body, a bush-form hub integral with said web, a stub shaft fixed to said frame means and rotatably mounting said wheel body on said frame means, a motor for driving said body, drive transmission means arranged to interconnect said motor and said body and including a driving pinion and a driven gear respectively connected to said motor and said body, said pinion and gear being engageable with and disengageable from each other to connect said motor with said body and disconnect said motor from said body, said rotary wheel body fixedly mounting said driven gear, and means mounting said motor and said driving pinion as a unit on said frame means for relative movement between a first position in which said driving pinion and said driven gear are interengaged for driving said wheel body on operation of said motor and a second position in which said driving pinion is disengaged to permit free rotation of said wheel body, said driven gear being disposed inwards from said ground-engaging tire.

3,908,777
GOLF CAR SUNTOP

William G. Davidson, Elm Grove, Wis., assignor to AMF Incorporated, White Plains, N.Y.

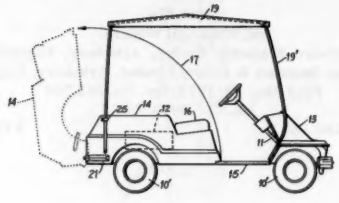
Filed Nov. 4, 1974, Ser. No. 520,532

Int. Cl.² B62D *25/06*

U.S. Cl. 180—69 C **1 Claim**

1. In a golf car having a suntop, the car having a wheeled frame and steering means at the front end thereof and power means at the back end thereof for steering and driving the same, a body on said frame including a front portion covering said steering means and a separable back portion including generally vertically extending transversely opposite outer sides covering said power means and a floor board therebetween, said separable back portion including seat means for passengers, said suntop being mounted on said body to permit

said separable back portion to be swung open in a rearward direction from a horizontal position to an approximate vertical position to afford access to said power means, said suntop comprising a pair of generally inverted U-shaped frame members on opposite sides of said car each of said inverted U-shaped frame members being somewhat longitudinally flexible and including front and rear lower ends, and upper cross brace members interconnecting said inverted U-shaped members, the front ends of said suntop frame members being fixed to



said front body portion, the rear of said back body portion being hinged to the rear of said frame, and the back ends of said suntop frame members being pivoted to the opposite outer sides of said back body portion at the rear end thereof and said back body portion having a length relative the height of said suntop whereby said back body portion is adapted to be hinged open in a rearward direction with respect to said frame and suntop without interference with the upper cross brace members of said suntop.

3,908,778

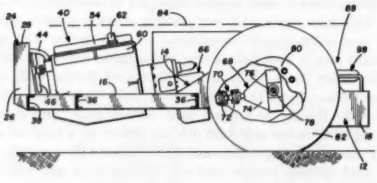
DIESEL TRACTOR FOR ARTICULATED MINE VEHICLES

Gerald Bruce Sien, Carlsbad, N. Mex., assignor to Sien Equipment Company, Carlsbad, N. Mex.

Filed Oct. 5, 1973, Ser. No. 404,098

Int. Cl.² B60K *5/02*

U.S. Cl. 180—77 MC **10 Claims**



1. A diesel tractor for articulated mine vehicles which comprises:

a frame including spaced, parallel rectangular tubular members interconnected at their extreme front ends by a transverse member and extending rearwardly to inverted U-shaped portions;

a diesel engine mounted on the frame just behind the transverse member and between the rectangular tubular members;

a power shift transmission mounted on the frame behind the engine and between the rectangular tubular members;

a differential mounted on the frame behind the power shift transmission and between the rectangular tubular members and including axles extending outwardly through the inverted U-shaped portions of the tubular members of the frame;

planetary hub means mounted on the axles and positioned outside of the rectangular tubular members of the frame; tire means mounted on the planetary hub means and comprising the sole support for the diesel shuttle car tractor; and

an operator's compartment extending between the rectangular tubular members of the frame and positioned behind the differential;

said rectangular tubular members of the frame extending rearwardly from said operator's compartment for connection to a trailer;

all of the component parts of the tractor being positioned beneath a normally horizontally disposed plane extending tangent to the tops of the tire means;

said forward portions of the tubular members of the frame comprising relatively reduced vertical dimensions and said inverted U-shaped portions and the trailer connection portions of the frame comprising substantially increased vertical dimensions.

3,908,779

VEHICLE POWER STEERING CONTROL SYSTEM

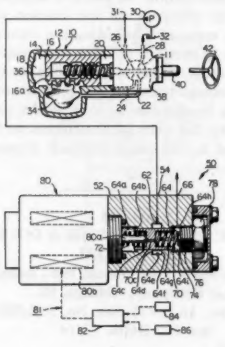
Naohiko Inoue, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Mar. 14, 1974, Ser. No. 451,287

Claims priority, application Japan, Mar. 15, 1973, 48-29373

Int. Cl.² B62D *5/08*

U.S. Cl. 180—79.2 R **2 Claims**



1. A power-assisted steering control system for a motor vehicle having a source of pressurized fluid and a fluid reservoir and comprising:

a steering gear defining therein a chamber and being operatively disposed between said source of pressurized fluid and said fluid reservoir;

at least one fluid operated steering assistance actuator operatingly disposed in said chamber;

a valve to selectively connect said chamber with said source of pressurized fluid;

a fluid pressure control valve being operatively disposed between said source of pressurized fluid and said fluid reservoir, and being operative to modulate the pressure of fluid supplied to said chamber, said fluid pressure control valve forming therein a bore which is stepped to provide axially adjacent bore portions of difference cross-sectional area with shoulders between the bore portions and which receives axially movably a flow control member having at least one axially extending slot such as to allow said fluid to pass therethrough, an effective cross-sectional area of said at least one axially extending slot being varied in dependence upon axial movement of said flow control member such as to control the amount of said fluid flowing therethrough, thereby to modulate the pressure of said fluid supplied to said chamber; and

an electrical actuator responsive to at least one of the vehicle speed and the gradient of the road surface on which the vehicle is driven and having a mechanical actuating member operatively connected with said flow control

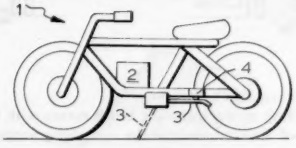
member, said mechanical actuating member being moved substantially proportionally to the degree of at least one of the vehicle speed and the gradient.

3,908,780

MOTORCYCLE SAFETY SYSTEM

Clifford McClure, Sumerco, W. Va. 25567, and Marvin G. McClure, Box 230, Rt. 1, Yawkey, W. Va. 25573

Filed Sept. 25, 1974, Ser. No. 509,122
Int. Cl.² B60K *28/00*
U.S. Cl. 180—82 R 5 Claims



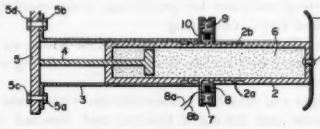
1. A safety system for motor vehicles including
an engine and
a storage stand, said safety system having engine-defeating means including
an engine defeat switch, said switch being positioned to be engaged by said storage stand when said stand is in its raised position, said engine-defeating means including
an engine-operating electrical circuit and said switch being connected in said circuit to defeat said circuit and said engine until said storage stand is in its raised position.

3,908,781

VEHICLE IMPACT ABSORBING BUMPER DEVICE WITH COLLISION DETECTOR

Kazuo Oishi, Oobu; Takashi Yamada, Anjo, and Takeshi Matsui, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 25, 1973, Ser. No. 409,456
Claims priority, application Japan, Nov. 24, 1972, 47-118356
Int. Cl.² B60R *21/02*
U.S. Cl. 180—91 4 Claims



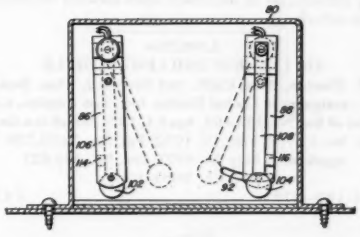
1. A vehicle impact absorbing bumper device having a collision detector comprising: an impact absorbing bumper device having a cylinder attached to either a mounting stay on the body of a vehicle or a bumper located opposite to said mounting stay; a first piston attached to the other of said mounting stay and said bumper to be movable in said cylinder relative thereto; an impact absorbing medium in said first piston; a second piston one end of which is inserted in said first piston, the other end of which is fixed to either one of said mounting stay and said bumper which is secured to said cylinder, said impact absorbing medium being compressed by said second piston at the time of a collision for absorbing the impact of the collision; and a collision detector having voltage generating means provided in said cylinder and including a stator for providing a magnetic path and a generating winding for generating the voltage in accordance with the variation of the magnetic reluctance of said magnetic path, and a plurality of alternately arranged projections and notches made of a magnetic material and formed on said first piston to be movable in said generating means to change said magnetic reluctance.

3,908,782

AUTOMATIC STABILITY CONTROL SYSTEM

Thomas J. Lang, Torrance, Calif.; Joseph A. Lang, Huntington Station; Kenneth G. Lang, East Northport, and Robert L. Davis, Huntington, all of N.Y., assignors to Lang Davis Industries, Inc., Huntington, N.Y.

Continuation-in-part of Ser. No. 269,035, July 5, 1972. This application Sept. 20, 1973, Ser. No. 399,196
Int. Cl.² B60T *7/20*
U.S. Cl. 180—103 21 Claims



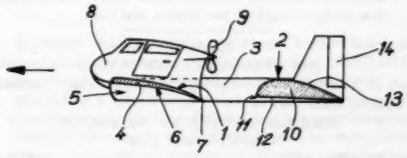
1. An automatic stability control system for a vehicle to prevent swerving and swaying of said vehicle, said system comprising: means for sensing lateral acceleration forces acting upon said vehicle to provide low level electrical a cceleration signals proportional to the magnitude of said forces, means for amplifying said low level acceleration signals to provide large amplitude brake control signals proportional to the magnitude of the forces, and brake means associated with said vehicle including right andleft brakes and responsive to said brake control signals to simultaneously actuate and right and left brakes in an equal gradual and continuous mode to prevent swaying and swerving of said vehicle, said sensing means including a suspended mass oriented to sense lateral acceleration and provide instantaneous response upon sensing lateral acceleration.

3,908,783

WINGED SURFACE EFFECT VEHICLE

Gunther Joerg, Grossbieberau, and Olaf Volkersen, Zwingenberg, both of Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed Jan. 25, 1974, Ser. No. 436,485
Claims priority, application Germany, Jan. 27, 1973, 2303972
Int. Cl.² B60V *1/08*
U.S. Cl. 180—116 5 Claims



1. In a winged surface effect vehicle having two interconnected first and second wings spaced apart in the direction of forward flight and being disposed in about similar levels, the improvement comprising:

the first one of the wings having profile, which is aerodynamically effective in significant dependency upon altitude and distance from the ground underneath the vehicle, the first wing having a profile for producing lift predominantly on its pressure side as compared with lift produced by suction on the upper side and upon forward movement of the vehicle;

the second one of the wings being disposed to the rear of the first one and having a profile which is aerodynamically effective to a significantly lesser degree of dependency upon altitude and distance from the ground than said altitude dependency by said first wing in that the lift produced by the second wing is reduced to a lesser degree with increasing distance from ground than the lift produced by the first wing is decreased with increasing altitude, the second wing constructed to provide lift predominantly on its suction side as compared with lift produced by pressure on its underside upon forward movement of the vehicle.

3,908,784

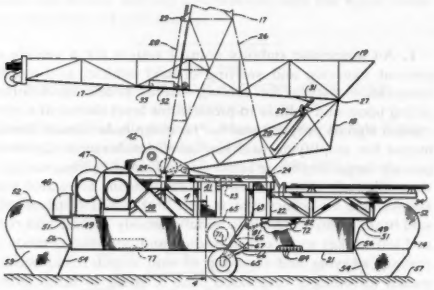
AIR CUSHION DRILLING VEHICLE

Leon C. Blurton, Brea, Calif., and Saverio J. Cina, Brooklyn, N.Y., assignors to Global Marine Inc., Los Angeles, Calif.

Division of Ser. No. 130,462, April 1, 1971, which is a division of Ser. No. 12,778, Feb. 19, 1970, Pat. No. 3,693,729. This application May 24, 1973, Ser. No. 363,523

Int. Cl.² B60V *1/11*

U.S. Cl. 180—119 **5 Claims**



1. An air cushion vehicle comprising:

a load supporting chassis;

flexible skirt means around the periphery of the chassis and depending therefrom for cooperation with a surface for minimizing air flow therebetween;

means on the chassis for supplying air under pressure within the skirt means for maintaining sufficient pressure to support a major portion of the weight of the chassis and load;

a plurality of wheels within the skirt means and beneath the vehicle; and

means for yieldably biasing the wheels downwardly from the vehicle for yieldably engaging a surface with a predetermined substantially constant force equal to a minor portion of the weight of the chassis and load.

3,908,785

AIR CUSHION CONVEYANCES

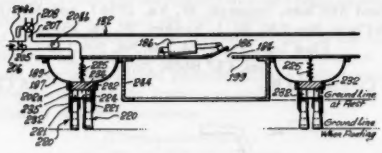
Jack F. Vaughen, 26807 Spring Creek Rd., Palos Verdes Peninsula, Calif. 90274

Filed Feb. 16, 1972, Ser. No. 226,729

Int. Cl.² B60V *1/16*

U.S. Cl. 180—127 **18 Claims**

1. In a fluid cushion device of the plenum chamber type capable of supporting a superimposed load of high magnitude wherein a sealing assembly extending downward from a load-bearing base to confine a fluid cushion comprises an annular inflatable hanger projecting from the base and annular structure projecting from the hanger to close proximity to the underlying support surface over which the device operates and wherein sealing means is incorporated in said annular structure in the lower portion thereof to retard escape of fluid from the cushion,



the improvement comprising:

said sealing means including brush means with the bristles thereof directed towards the underlying support surface; and

at least one barrier of flexible sheet material enclosing the brush means to minimize leakage from the fluid cushion through the bristles of the brush means.

3,908,786

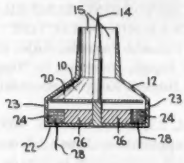
STING OSCILLATOR

Paul A. Curto, Hillcrest Heights, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 18, 1970, Ser. No. 47,505

Int. Cl.² H02K *35/06*

U.S. Cl. 181—.5 **1 Claim**



1. A sting oscillator for producing sonic oscillations of a steady fluid flow, comprising:

a. a radially-symmetric enclosed volume having an open end to receive said steady fluid flow and defining a resonant cavity;

b. a rigid rod attached concentrically within said enclosed volume and having a tapered end directed outwardly from said open end of said enclosed volume for causing perturbations in said steady fluid flow, whereby fluid vortices are generated causing the pressure in said enclosed volume to alternately increase and decrease periodically;

c. a transducer for coupling out the power generated by said alternating pressure waves.

d. a metal diaphragm located within said resonant cavity so as to vibrate in response to said alternating pressure waves;

e. a circular permanent magnet located parallel and adjacent to said metal diaphragm, the vibrations of said diaphragm perturbing the magnetic field set up thereby;

f. a coil wound around said circular magnet in which an emf is induced in response to the perturbation of said magnetic field by said metal diaphragm; and

g. output means connected to said coil for coupling out said emf generated therein.

3,908,787

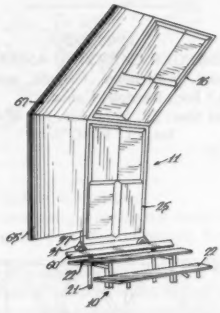
PORTABLE ACOUSTICAL SHELL AND RISER STRUCTURE

Jerry A. Wenger, Owatonna; David L. Paine, Ellendale; Harvey M. Urch, West Concord; Ronald C. Dobrunz, and Ronald N. Probst, both of Owatonna, all of Minn., assignors to Wenger Corporation, Owatonna, Minn.

Filed Oct. 9, 1974, Ser. No. 513,268

Int. Cl.[2] E04B *1/99*; E04G *1/00*; A47G *5/00*

U.S. Cl. 181—30 16 Claims



1. A portable acoustical shell and riser structure including a step unit having a pivotal linkage system movable between transport and operative positions and having floor-engaging wheels positioned for floor engagement in the transport position and a series of vertically-spaced steps for use in the operative position, an acoustical shell, and means for piviotally hinging said acoustical shell to said step unit for movement between a transport position in closely spaced relation to said step unit and an operative position extending generally upright and at an angle to said step unit.

3,908,788

SILENCER AND FLOW REGULATOR PARTICULARLY FOR WATER CONDUITS

Curt Lennart Hammarstedt, Nygatan 2, Alstermo, Sweden

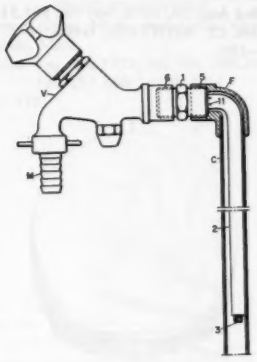
Filed Aug. 30, 1973, Ser. No. 392,879

Claims priority, application Germany, Sept. 11, 1972, 7233494

Int. Cl. E04b *1/99*

U.S. Cl. 181—33 S 15 Claims

1. A silencing and flow regulating device for flowing liquid and particularly for flowing water, said device comprising; a deformable and elastic tube insertable to extend in a conduit section for flowing liquid, said tube having inner and outer surfaces, the outer surfaces having a diameter smaller than the internal diameter of the conduit section; and means for anchoring one end of said tube in the conduit section positioned so that substantially all of the liquid flows along one of said surfaces and that the other surface is exposed to substantially



standing liquid, applying pressure energy of the liquid to transversely deform said elastic tube.

3,908,789

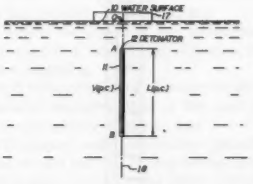
METHODS FOR GENERATING AND SHAPING A SEISMIC ENERGY PULSE

Oswald Alfonso Itria, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 239,530, March 30, 1972, abandoned. This application Oct. 30, 1973, Ser. No. 411,102

Int. Cl.[2] G01V *1/10*, *1/08*

U.S. Cl. 181—113 9 Claims



1. In seismic delineation of sedimentary section below the surface of a seismic energy propagation medium, a method for shaping a seismic energy pulse comprising the steps of,

a. generating a first energy pulse at a predetermined distance below the surface of the seismic energy propagation medium downwardly through the immediate surrounding energy propagation medium to form a compressional forward portion of the seismic energy pulse at a submerged point, and

b. simultaneously generating a second energy pulse upwardly which arrives later at the submerged point to form a rarefactional aft portion of the seismic energy pulse.

3,908,790

SONAR DOME WINDOW DAMPING AND APPLICATION PROCEDURE

Howard Neile Phelps, Jr., Coventry, R.I., and Daniel Dinsmore, Jr., East Lyme, Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 29, 1974, Ser. No. 501,511
Int. Cl.[2] A47B *81/06;* **G10K** *11/00*
U.S. Cl. 181—198 **4 Claims**

1. A sonar dome comprising:
a shell enclosure;
a rigid trusswork connected to the interior of said shell enclosure; and
a plurality of damping tiles affixed to the interior surface of said shell with each tile having a plurality of apertures.

3,908,791

SAFETY CLAMP

Richard A. Kleine, Peoria; Warren J. Byers, Morton, and Charles A. Wright, Peoria, all of Ill., assignors to Unarco Industries, Inc., Chicago, Ill.

Filed Nov. 2, 1973, Ser. No. 412,169
Int. Cl.[2] E06C *5/36*
U.S. Cl. 182—8 **11 Claims**

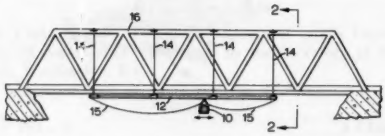
1. A safety device comprising:
a safety belt to be worn by a workman;
gripping means comprising a clamp having a body with an internally contoured body and a gripping brake arm pivotally mounted on the body, one end of the gripping brake arm being fastened to said safety belt;
an opposite end of said gripping brake arm having a contoured end positioned inside said internally contoured body for clutching a cable to prevent a workman from falling;
means comprising a web anchored at opposite ends to said belt and passing through said one end of the gripping arm attaching same to said belt; and
clamp supporting means comprising an angular open shelf mounted on said safety belt for supporting said clamp in a horizontal carrying position along the periphery of the safety belt while not in use, said clamp being swingably mounted on the web so as to be alternatively movable into a position for attachment with a cable and movable onto engagement with said angular open shelf on the belt when not in use.

3,908,792

PASSENGER CARRYING ASSEMBLY

Ronald F. Shortt, Whitehorse, Canada, assignor to Jimmy Rails (U.S.A.) Inc., Rexdale, Canada

Filed Mar. 29, 1974, Ser. No. 456,386
Int. Cl.[2] E04G *3/10*
U.S. Cl. 182—37 **1 Claim**

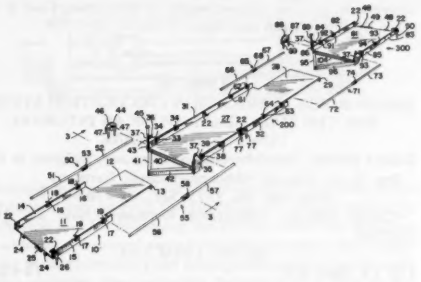


1. A passenger carrying assembly for supporting a passenger in close proximity to a tall structure, comprising:
a. a passenger carrying member;
b. horizontal rail means located above the passenger carrying member and of length greater than the horizontal length of the passenger carrying member;
c. first adjustable support cable means fixed above the rail means to said tall structure and depending therefrom to the rail means for adjusting its height with respect to said tall structure;
d. said rail means comprising plural lengths of rail disposed end-to-end and each rail having a top wall, spaced side walls, and bottom inwardly-facing flanges extending toward each other from said side walls;
e. dolly means in the rail means and running on said flanges;
f. second adjustable support means coupling said dolly means with said passenger carrying member and supporting the latter below the rail means;
g. pulling line means extending between the passenger carrying members and the ends of the rail means;
h. coupler means spaced along said rail means and located at each end-to-end junction of adjacent lengths thereof, each coupler means comprising opposed coupler plates having lower portions shaped to overlie the walls and flanges of the rail means and the coupler plates having upper portions approaching each other and extending upwardly from the rail means and transfixed by bolt means, each coupler means being connected with a first support cable means; and
i. at each end-to-end junction, locking means comprising two vertical pins joined by a horizontal bar, the pins passing through lower portions of the coupler and respectively through walls of the adjacent rails, and the bar of the locking means being confined against the coupler means by one of said bolt means to prevent removal of the pins.

3,908,793
ADJUSTABLE METAL SCAFFOLD

John Edward Vaughn, Houston, Tex., and William Bradley Dixon, New Castle, Del., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Nov. 1, 1974, Ser. No. 519,999
Int. Cl.[2] E04G 3/08
U.S. Cl. 182—82 9 Claims

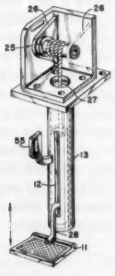


1. A scaffold module comprising:
a first section comprising a horizontal deck having a tongue of reduced width extending outwardly from one end of the deck;
a middle section comprising an elongated horizontal deck having a tongue of reduced width at one end of the deck and a support means extending outwardly from the second end of the deck;
said first section tongue being in slidable contact with the top of the support means, and with the bottom, of the middle section deck; and
a third section comprising a horizontal deck and a support means extending outwardly from one end of the deck;
said middle section tongue being in slidable contact with the top of the support means, and with the bottom, of the third section deck.

3,908,794
DETACHABLE BOAT BOARDING DEVICE

Richard L. Stone, 8 N. Koewing Pl., West Orange, N.J. 07052

Filed Nov. 16, 1973, Ser. No. 416,582
Int. Cl.[2] B63B 39/02
U.S. Cl. 182—91 4 Claims

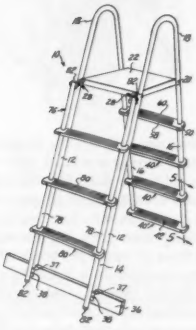


1. A boat boarding device designed to be detachably connected to said boat consisting of a frame, a shroud attached thereto, a vertical shaft member positioned in a guide in said shroud, a platform hingeably connected to said vertical shaft member, a winch positioned in said frame above said shroud and a cable attached at one end to said vertical shaft member and at the other end to said winch whereby said platform and said vertical shaft member are moved upwardly and downwardly between means for limiting the distance of travel of said platform.

3,908,795
SAFETY LADDER FOR ABOVE-THE-GROUND SWIMMING POOLS

Peter F. Gannon, Troy, Mich., assignor to Vinyl-Fab Industries, Ferndale, Mich.

Filed Aug. 15, 1973, Ser. No. 388,393
Int. Cl.[2] E06C 1/39, 1/14
U.S. Cl. 182—118 2 Claims



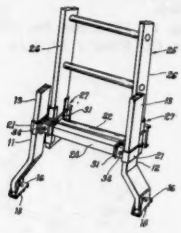
1. A safety ladder for an above-the-ground swimming pool provided with a peripheral wall forming a separation between a water side and a ground side, said ladder comprising:
platform means elevated above the ground,
support means holding said platform means above said peripheral wall,
a pivotal detachable ladder section having two substantially parallel and elongated spaced side tubular members and a plurality of steps fastened intermediate of said side support members, each of said steps being made of a hollow molding having an aperture on each end for receiving said side tubular members therethrough and means to secure said steps to said tubular members when said steps are properly positioned, and
connecting means for pivotally and detachably attaching said ladder section to said platform means, said connecting means comprising:
a pin, disposed through aligned apertures at the end of each of said tubular members and at the end of a bracket fastened to said platform means, and
a generally U-shaped resilient member pivotally mounted on one end of said pin and having a loop on its other end adapted to engage and lock the other end of said pin,
wherein said support means comprises a pair of spaced substantially parallel inverted V-shaped tubular side rail members, forming a pair of leg portions each disposed on a side of said pool peripheral wall, and a plurality of steps identical to said first mentioned steps secured intermediate said tubular side rail members along one leg portion thereof disposed on the water side of said peripheral wall, wherein the leg portion disposed on the ground side of said peripheral wall forms an abutment and support means for said pivotal detachable ladder section, each of the steps on said pivotal detachable ladder section having proximate each end thereof a side recess for receiving a portion of the periphery of each of said side rail members when said pivotal detachable ladder section is in a downwardly extending position abutting against said side rail members.

3,908,796

SELF-LEVELLING ACCESSORY FOR LADDERS

Mathew Hurwitz, 63 Oakland Ave., Auburndale, Mass. 02166

Filed Oct. 4, 1974, Ser. No. 512,121
Int. Cl.² E06C 7/44
U.S. Cl. 182—201 **6 Claims**



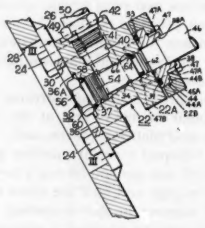
1. A self levelling and self locking accessory for supporting an extension ladder having a pair of side rails and rungs extending between said side rails, said accessory comprising a pair of open ended sockets, each adapted to be secured outwardly of and in close proximity to a respective side rail, a pair of ground engaging legs, each leg having a lower portion outwardly offset from an upper portion with the upper portion of each leg being received in a respective socket and freely independently slidable therein, said sockets and legs being substantially quadrilateral in cross-section, said legs when the weight of the ladder is removed from the legs being independently freely movable in said sockets to accommodate to the terrain on which the ladder is rested, said legs being automatically self binding and locked in adjusted positions when the weight of the ladder thereafter is imposed on said legs.

3,908,797

COMMON DRAINAGE SYSTEM AND APPARATUS FOR ENGINE OIL SUMP AND FOR OIL FILTER OF ENGINE

James M. Schnepp, Mesa, Ariz., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Mar. 19, 1974, Ser. No. 452,626
Int. Cl.² F16M 13/02; F01M 11/00
U.S. Cl. 184—1.5 **12 Claims**



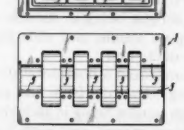
1. In combination, an engine, a lubricating circuit for said engine including means for supplying a lubricating fluid to said engine, said engine including a crankcase providing a sump for lubricating fluid, a filter connected in a fluid flow path of said lubricating circuit for filtering impurities from lubricating fluid flowing in said circuit, a first drain line distinct from said lubricating circuit and connected to said sump for draining said sump, a second drain line distinct from said lubricating circuit and connected to said filter for draining a fluid sludge or the like which has collected in said filter, a common drain manifold for said sump and for said filter, said common drain manifold including a drain outlet, said first and said second drain lines being connected in fluid communication with said common drain manifold, a drain plug received in said manifold in plugging relation to said drain outlet whereby to prevent drainage from said sump and from said filter through said drain outlet, said plug being movable out of plugging relation to said drain outlet to permit drainage from said sump and from said filter through said drain outlet, and sealing means between said plug and a surface of said manifold for fluidly isolating said first and said second drain lines from each other when said plug is in plugging relation to said drain outlet, whereby to prevent contamination of lubricating fluid in said sump by sludge from said filter.

3,908,798

PRESSURIZED LUBRICATION CIRCULATION SYSTEM FOR THE MAIN BEARINGS OF AN INTERNAL COMBUSTION ENGINE

Robert Binder, Schwieberdingen, Germany, assignor to Dr. - Ing. H.c.F. Porsche Aktiengesellschaft, Germany

Filed Nov. 26, 1973, Ser. No. 418,906
Claims priority, application Germany, Nov. 24, 1972, 2257651
Int. Cl.² F01M 1/04
U.S. Cl. 184—6.5 **14 Claims**



1. A lubricant supply system for the main bearings of an internal combustion engine of the type having a plurality of main bearings and a two-part engine housing for accommodating said main bearings, the two parts of the engine housing being joined together along a separation plane at flanges exhibiting sealing surfaces; said system comprising:

a main lubricant circulating line,

a pair of lubricant tie lines for each main bearing which extend from said main line to each of said main bearings with the tie lines of a pair opening to a respective main bearing at respective diametrically opposite lateral sides of said respective main bearing,

wherein each of the main line and the tie lines are formed by groove-like recesses opening to the sealing surface of one of said engine parts, said recesses being sealed off by the sealing surface of the other of said engine parts in the assembled condition of the engine parts,

and a relief groove in one of said engine parts, said relief groove extending around the main line at a spacing toward the outside of the engine housing for collecting any lubricant that may leak outwardly of said main line between said sealing surfaces of said flanges.

3,908,799

APPARATUS FOR DISPENSING A FLUID IN A CONDUIT INTERIOR

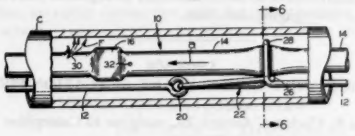
Anthony J. Valeriano, 669 Shuttle Meadow Ave., New Britain, Conn. 06052

Filed July 5, 1974, Ser. No. 486,158
Int. Cl.² F16N 3/00
U.S. Cl. 184—38 R **9 Claims**

1. Apparatus for dispensing a fluid in a conduit interior comprising:

an elongated rod having first and second ends and being sufficiently rigid to push the first end through a conduit in advance of the second end;

a section of tubing having a flexible tube wall and having a hollow tube interior between a first end of the section and a second end for storage of a fluid, the tubing section also having an opening in the tube wall adjacent the first end for dispensing stored fluid; and



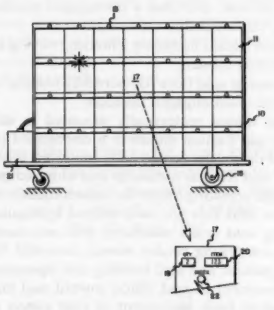
clamping means located on the elongated rod between the first and second ends for attaching the tubing section to the rod and for squeezing the flexible tube wall together adjacent the second end of the tubing section, the clamping means permitting the tubing section to move through the clamping means thereby forcing stored fluid in the tube interior out of the opening adjacent the first end of the tubing section.

3,908,800

ITEM SELECTING SYSTEM

Raoul E. Drapeau, Vienna, Va., assignor to Scope Incorporated, Reston, Va.

Filed Apr. 12, 1974, Ser. No. 460,529
Int. Cl.[2] B65G *63/02*
U.S. Cl. 186—1 R **2 Claims**



1. An item selecting system for aiding manual handling of said items by a human operator comprising

a computing means for reading a batch of customer order data including item identity and quantity and arranging said data in warehouse location sequence;

a memory unit means coupled to said computing means for reading and storing said sequenced data;

display means coupled to said memory for displaying total pick quantity and item location and other identity;

a cart having a plurality of compartments equal in number or greater than the number of orders in the batch and associated distribution indicators for identifying the quantity thereof for each of said identified compartments; and

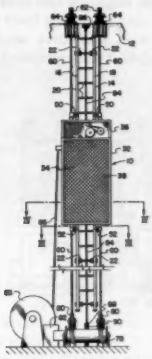
means coupling the output of said memory unit means to said distribution indicators.

3,908,801

VERTICAL HOIST ASSEMBLY

Joe C. Pohlman, Pittsburgh, Pa., assignor to Vertical Transport Company, Pittsburgh, Pa.

Filed Mar. 13, 1974, Ser. No. 450,561
Int. Cl.[2] B66B *5/24*
U.S. Cl. 187—88 **6 Claims**



1. A vertical hoist car assembly for use in upwardly tapering structures and for travelling along a generally upright course therein, comprising

elongated track means having a ladder construction of two generally parallel side rails interconnected by a plurality of transversely extending, longitudinally spaced rungs;

support means for firmly supporting said track means in an upright manner on an upright surface;

a service car means for moving along the upright course, the car having upper and lower rotatable wheels arranged and constructed to engage the side rails of said track means; said car having a floor at the lower end portion thereof with the floor being provided with an opening sized for ready entrance and exit by personnel and located and arranged for ready access by personnel to said track means whereby personnel may readily enter and exit said service car from and to said track means; and a door covering said opening;

safety cable means extending between the upper and lower end regions of said track means and arranged and constructed for receiving personnel safety clamp means;

suspension means for suspending said car on said track means;

power means for supporting said suspension means and for lifting and lowering said car; and

braking means arranged and constructed on said service car to engage said side rails, with said braking means being operable with said suspension means to be disengaged from said side rails when said suspension means is under tension and to engage said side rails in braking engagement when tension is released from said suspension means.

3,908,802

ELECTROMAGNETIC BRAKE

Toyohisa Shimodaira; Akio Sato, and Ikuo Kumagai, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 30, 1973, Ser. No. 411,056
Claims priority, application Japan, Nov. 1, 1972, 47-108816
Int. Cl.[2] F16D *55/02, 65/56*
U.S. Cl. 188—71.8 **16 Claims**

3. An electromagnetic brake comprising

an axially extending braking shaft,

at least one brake wheel secured to said braking shaft for rotation therewith,

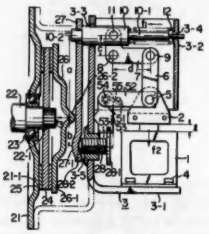
brake linings secured to said brake wheel,

brake shoe means for engaging said brake linings, said brake shoe means being configured to mate with said brake linings, and said brake shoe means being movable in a direction parallel to said axially extending braking shaft, operating lever means for applying force to said brake shoe means, thereby engaging said brake shoe means with said brake linings, said operating lever means having first and second ends with said force applied to said brake shoe means at a point of said operating lever means intermediate of said first and second ends, said operating lever means being pivoted about a fulcrum at said first end,

an adjust screw threadedly engaged with a base, said adjust screw having one end acting as said fulcrum,

electromagnetic force effecting means for effecting an operative force to said second end of said operating lever means to engage said brake shoe means with said brake linings by lever action about said fulcrum, and

adjusting means for adjusting said fulcrum as a function of brake lining wear, said adjusting means including means for turning said adjust screw in response to said brake lining wear.



3,908,803

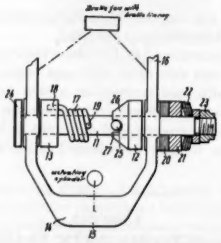
ADJUSTING DEVICE FOR BRAKES

Alfred Otto; Hermann Josef Feldhoff, both of Remscheid; Heinrich Kupiek, Holzwickede, and Gerd Brackelmann, Unna-Uelzen, all of Germany, assignors to Bergische Stahl-Industrie, Remscheid and Montanhydraulik GmbH Co. KG, Holzwickede, both of, Germany

Filed Apr. 19, 1974, Ser. No. 462,338

Int. Cl.[2] F16D *65/52*

U.S. Cl. 188—71.8 **10 Claims**



1. An adjusting device, especially for rail vehicles, which includes: stationary supporting means, shaft means turnably mounted in said supporting means, brake lever means pivotably supported by said shaft means, a brake disc, brake means operatively connected to said brake lever means for selective braking engagement and disengagement with said brake disc, slip clutch means frictionally coupling said shaft means to said brake lever means, limit stop means fixedly connected to a peripheral portion of said shaft means so as to turn therewith, first and second abutment means arranged stationarily with regard to said shaft means and said stop means to respectively engage the latter and stop the turning movement of said shaft means in braking direction and in brake disengaging direction respectively, and spring means having one end portion thereof operatively connected to one of said stationary supporting means and having its other end portion operatively connected to said shaft means so as continuously to urge said shaft means in brake disengaging direction.

3,908,804

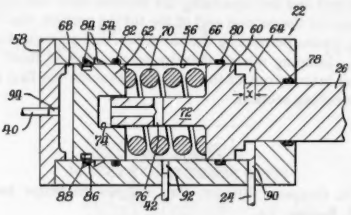
SERVICE AND PARKING BRAKE ACTUATION PISTON WITH ADJUSTER MECHANISM

Thomas E. Cochran, Aurora, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed July 11, 1974, Ser. No. 487,727

Int. Cl.[2] F16D *65/24*

U.S. Cl. 188—170 **7 Claims**



1. In an adjustable brake-actuating assembly, the combination comprising:

friction means for engaging a rotatable element;

actuator means for moving said friction means into an engaged position, and into a disengaged position with respect to said rotatable element;

said actuator means including a housing having a cylindrical bore formed therein;

spring means in said bore for normally biasing said friction means into said engaged position;

first piston means reciprocally mounted in said bore for moving said friction means to a disengaged position;

second piston means reciprocally mounted in said bore for biasing said friction means to said engaged position; and

automatic adjusting means for automatically adjusting the stroke of said first and said second hydraulic means for adjusting said brake assembly, said automatic adjusting means comprising ratchet means mounted between one of said pistons and said housing and operative to permit free movement of said piston toward said engaged position and to limit movement of said piston toward said disengaged position.

3,908,805

ANTI-SKID CONTROL DEVICE AND SYSTEM

Walter H. Morse, South Windsor, and Ira R. Ames, Jr., Salisbury, both of Conn., assignors to The Jacobs Manufacturing Company, West Hartford, Conn.

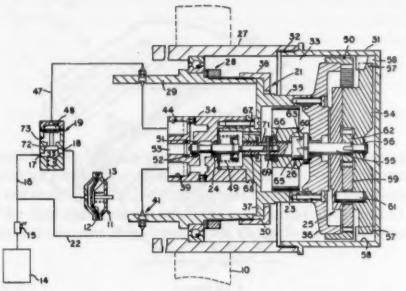
Filed Jan. 9, 1974, Ser. No. 431,952

Int. Cl. B60t *8/16*

U.S. Cl. 188—181 A **19 Claims**

1. A motor vehicle including an axle tube having a wheel hub mounted thereon for relative rotation and having an open end; a hub cap covering over the open end of the axle tube and secured to the wheel hub for rotation with the latter, the hub cap defining an interior chamber adjacent the open end of the axle tube; an anti-wheel lock-up control device disposed in part in the open end of the axle tube and projecting in part

into the chamber provided by the hub cap; retaining means detachably coupling the control device to the axle tube, the control device having an input drive shaft; means drivingly engaging the hub cap with the input drive shaft; a wheel mounted upon the wheel hub; a source of service air; a brake valve selectively operable for feeding the service air to a main line; a brake actuator having a pressure pilot chamber subject to reception of service air for applying braking torque to the wheel; a service air relay having an inlet connection with the main line, an outlet connection with the pilot chamber of the brake actuator, and a vent to atmosphere; a pressure air operable pilot valve in the relay normally communicating the inlet and outlet and blocking the outlet from the vent; the control device having a supply inlet connected to a branch of the main line, an air signal outlet connected for conducting an air signal to pressurize the pilot valve in the relay, and a signal vent to atmosphere; a control valve in the control device shiftable from a normal position communicating the signal outlet to the signal vent to a reserve position sealing the signal vent and communicating the supply inlet with the signal outlet, and inertia flywheel means in the control device having response to rapid decelerating and accelerating actions of the wheel controlling shifting of the control valve.



3,908,806

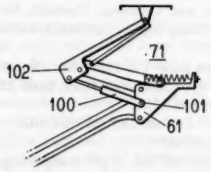
HIGH SPEED CURRENT COLLECTION

Roland E. Leger, 80 Boulevard Magenta, Paris 10 eme, France

Division of Ser. No. 236,874, March 22, 1972. This application Jan. 11, 1974, Ser. No. 432,468

Int. Cl. B60l *5/24*

U.S. Cl. 191—66 **3 Claims**



1. In a method for the high speed transfer of current to an overhead catenary wire distribution system in which the low amplitude periodic vertical displacements resulting from interaction between a current collector and the catenary and the greater amplitude vertical displacement due to the shape of the static profile of the catenary are detected separately, the improvement comprising the separate detection of and compensation for low amplitude displacements at a plurality of frequencies.

3,908,807

BICYCLE THREE-SPEED HUB

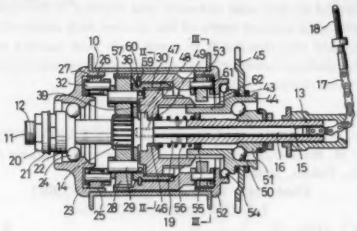
Nobuo Ozaki, and Sadao Kawai, both of Osaka, Japan, assignors to Maeda Industries, Ltd., Osaka, Japan

Filed July 25, 1974, Ser. No. 491,761

Claims priority, application Japan, July 25, 1973, 48-83465

Int. Cl.[2] B60K *41/26;* **F16H** *3/44*

U.S. Cl. 192—6 A **5 Claims**



1. A three-speed hub of a bicycle comprising
a hub shell,
a first hub cone secured to one end of said hub shell and having internal ratchet teeth,
a second hub cone secured to the other end of said hub shell and having internal ratchet teeth,
a hub spindle passing through said hub shell,
said hub spindle having an axial hole and a vertical slot communicating in position with said axial hole,
an operation rod having a threaded inward end and being inserted within said axial hole of hub spindle in the manner that it is axially movable by means of an external known control device connected thereto,
a sliding key screwed to said inward end of the operation rod and disposed slidably within said vertical slot of hub spindle,
a driver connected to a sprocket wheel so as to be driven thereby and being rotatable about said hub spindle,
said driver being rotatable with relative to said second hub cone and having an integral hollow spline shaft extending inwardly therefrom,
a sun pinion fixedly mounted on said hub spindle,
a plurality of planet pinions which are always in mesh with said sun pinion,
a plurality of low-normal gear pawls which are engageable in one direction with said internal ratchet teeth of the first hub cone,
a planet cage which supports said planet pinions at one position and said low-normal gear pawls at another position,
said planet cage having a substantially cylindrical extension of which internal periphery is formed with concavo-convex surface serving as a boss,
a gear ring which is always meshed with said planet pinions and has a substantially cylindrical extension circumferentially spaced apart a short distance from said extension of planet cage,
a plurality of double-acting pawls swingably supported at one end of said extension of gear ring,
the outward end of each of said double-acting pawls being engageable in one direction with said ratchet teeth of the second hub cone,
a hollow sliding clutch disposed within said extension of planet cage and having an integral spline shaft and reduced portion extending from said spline shaft thereof,
said sliding clutch having an integral inward flange with which said sliding key is associated,
said spline shaft of sliding clutch being disengageably coupled with said concavo-convex internal surface, viz. boss of said planet cage,
the internal periphery of said reduced portion of sliding clutch being formed with concavo-convex surface serving

as a boss to be engageable and axially slidable with said spline shaft extending from said driver,

the external periphery of said reduced portion of sliding clutch being formed with ratchet teeth engageable in one direction with the inward end of each of said double-acting pawls, and further being formed with an smooth surface next to said ratchet teeth thereof,

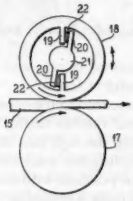
and, each of said double-acting pawls being swingably supported so that said outward end thereof is disengageable with said ratchet teeth of the second hub cone when said inward end thereof is in mesh with said ratchet teeth of the sliding clutch or is in contact with said smooth surface of the sliding clutch.

3,908,808

ULTRASONIC CALENDERING OF PAPER WEBS

Leroy H. Busker, Rockton, Ill., assignor to Nakajima All Co., Ltd., Tokyo, Japan

Filed Sept. 17, 1973, Ser. No. 397,887
Int. Cl.[2] B30B *13/00, 3/04*
U.S. Cl. 100—35 **8 Claims**



1. A method of calendering paper web, comprising:

running the paper web through the nip of a pair of cooperatively rotating calender rolls;

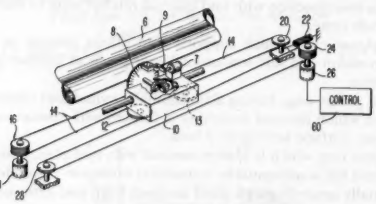
and vibrating peripherally at ultrasonic frequency at least one of said rolls as the web runs through said nip.

3,908,809

HIGH SPEED PRINTER

Horace S. Beattie, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,213
Int. Cl.[2] B41J *7/44, 19/00*
U.S. Cl. 197—18 **19 Claims**



13. A character-by-character printer having a type element positionable to present different characters to a print position wherein the time required to present successive characters varies in dependence upon particular succession of characters desired, and means supporting said type element and paper holding means for relative lateral displacement of said print position along a writing line, and means for impacting said type element onto said paper handling means, wherein the improvement comprises:

first means providing a source of continuous motion operatively connected to move said print position in the letter feed direction;

second means operative to superimposed variable incremental motion onto said continuous motion, and

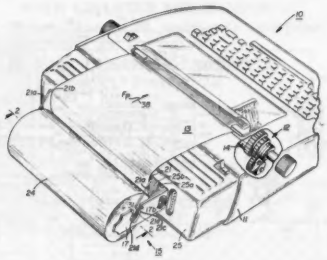
control means for operating said incremental motion means to cause said support means to arrive at said print position when a preselected character is at said print position.

3,908,810

PRINTER PAPER ROLL HOLDER WITH SPRING-CONTROLLED LINE FEED TENSIONER

Ronald S. Denley, Niles, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed June 19, 1974, Ser. No. 480,785
Int. Cl.[2] B41J *15/00*
U.S. Cl. 197—133 R **9 Claims**



1. A paper roll holder and tensioner comprising:

two rectangularly shaped paper roll holder arms, each of said arms being attachable at one end to a support member, and each of said arms having first and second inclined slots formed therein, said slots communicating with the upper edge of the associated arm as attached, and being spaced apart and inclined relative to each other so as to define an integral, tooth-like spring of predetermined resiliency therebetween;

a wire bail having two elongated and parallel extending leg portions which merge into an outwardly extending intermediate leg portion, the lower end region of each parallel extending leg portion being formed into a U-shaped section, with the spacing between the parallel segments thereof being dimensioned so that the parallel segments are both received within the second slot which is furthest from the attachment end of the associated arm, and the lower terminating segments of said U-shaped bail sections being mutually opposed and axially aligned so as to define spindles for rotatably supporting a roll of paper at the ends of a central core thereof.

3,908,811

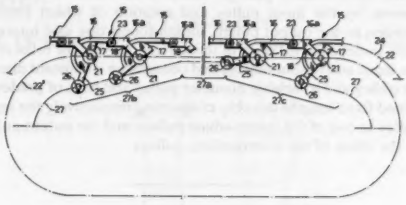
CONVEYOR, PARTICULARLY FOR PASSENGERS

Cesare Cortese, and Giuseppe Castoldi, both of Turin, Italy, assignors to Saiag S.p.A. Industria Articoli Gomma, Cirie, Italy

Filed June 19, 1974, Ser. No. 480,792
Claims priority, application Italy, June 22, 1973, 68866/73; Sept. 27, 1973, 69849/73
Int. Cl.[2] B65G *23/00*
U.S. Cl. 198—16 MS **14 Claims**

1. A conveyor of the type comprising: a conveyor belt composed of a plurality of consecutive belt segments; each of the segments having one end part carrying a deviation member extending horizontally transversely of the belt and guided on a pair of guide rails, and an opposite end part which is flexible and is deflectable away from the path of the belt by passing around the deviation member carried by the neighbour segment; and means for varying the length of the deflected portion of each of the belt segments, said means including a cam rail spaced at varying distances from its respective guide rail for the deviation member; the said conveyor being characterized in that the deviation members is a rotat-

able axially elongated winding member having anchored thereto its associated flexible part of its neighbour segment whereby the deflected length of the neighbour segment may be varied by rotation of the winding member, and the said means comprises a crank fast with the winding member, said



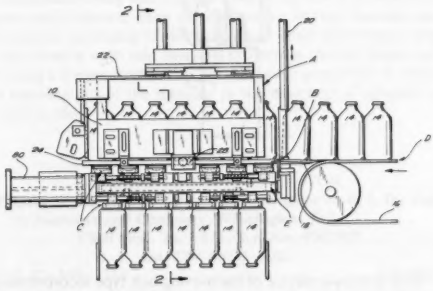
crank having a crank-pin operatively engaging with the cam rail in an arrangement whereby the winding member is rotated by the crank to wind the flexible part thereonto as the distance of the cam rail from the guide rail increases and to unwind the said flexible part therefrom as the same distance decreases.

3,908,812

APPARATUS FOR PACKING EITHER 25 OR 26 BOTTLES INTO A CONTAINER

William R. Graff, Lynchburg, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed Mar. 20, 1973, Ser. No. 342,960
Int. Cl.² B65G *47/00*
U.S. Cl. 198—22 B **18 Claims**



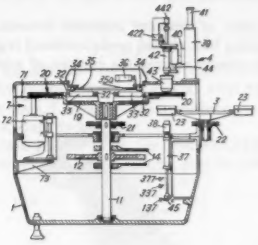
1. A bottle packing apparatus comprising means for receiving M bottles in an array, where M is an integer larger than four, holding means for holding N bottles, where N is an integer smaller than M, gravity-drop means for transferring N bottles from said receiving means to said holding means leaving M-N bottles in said receiving means, and means for thereafter feeding N bottles into said receiving means, thereby to refill said receiving means with M bottles, said transferring means and said receiving means being movable together between a position adjacent said holding means and a position remote therefrom, said transferring means comprising a bottle support movable relative to said receiving means between first and second positions, said support when in said first position having support parts beneath each of said M bottles, thereby to maintain them within said receiving means, said support when in said second position having support parts beneath only said M-N bottles, thereby maintaining them within said receiving means while permitting said N bottles to drop from said receiving means.

3,908,813

AUTOMATIC MACHINE FOR THE PROCESSING OF ARTICHOKES

Gianni Bertonelli, Parma, Italy, assignor to F B R S.r.l., Pancrazio, Italy

Filed Aug. 28, 1972, Ser. No. 284,093
Claims priority, application Italy, Sept. 25, 1971, 46874-71
Int. Cl. B65g *47/82, 29/00;* **A23n** *15/04*
U.S. Cl. 198—24 **3 Claims**



1. In an automatic machine for the processing of artichokes comprising a base, a main turntable rotatably supported on said base by a main shaft, and a plurality of stations for treating artichokes successively spaced adjacent the peripheral portion of said turntable, the improvement which comprises: a service turntable rotatably mounted near one side of said main table, with the peripheral portions of said tables overlapping at one point during their rotation, and said service turntable being provided with a plurality of artichoke receiving means spaced about its periphery,

said main turntable comprising a plurality of artichoke gripping means distributed about the peripheral portion of said main turntable and spaced from each other by a distance equal to the distance between said stations,

means for rotating said turntables intermittently and in synchronism to bring gripping means on said main turntable and artichoke receiving means on said service turntable periodically into vertical alignment where said turntables overlap,

means for automatically transferring an artichoke from said receiving means to said gripping means when said alignment occurs,

said gripping means comprising two superposed stationary plates with a movable plate rotatably mounted between them, said plates defining registering apertures therein having a common axis about which said movable plate rotates, and defining an artichoke receiving opening, at least three gripping arms engaging one of said stationary plates and said movable plate so that rotation of said movable plate relative to said stationary plates swings one end of each gripping arm into and out of said opening, a connecting rod for rotating said movable plate, and cam means driven by said turntable rotating means positioned to actuate said connecting rod to swing said gripping arms into said aperture to grip an artichoke.

3,908,814

METHOD AND APPARATUS FOR HANDLING IRREGULAR OBJECTS

Wilhelm Hieronymus, Peterborough, Canada, assignor to Sphere Investments Limited, Nassau, Bahamas

Filed Aug. 27, 1973, Ser. No. 391,909
Claims priority, application United Kingdom, Sept. 6, 1972, 41291/72
Int. Cl.² B65G *47/22*
U.S. Cl. 198—34 **4 Claims**

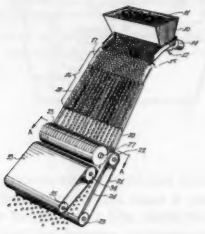
1. Apparatus for providing a feed of irregularly sized and shaped objects in a spaced arrangement, comprising

means for providing an input of laterally spaced rows of said objects and including an entry plate for receiving said laterally spaced rows of said objects and discharging said objects at a first predetermined speed,

an accelerating belt moving at a second predetermined speed greater than said first predetermined speed,

said entry plate and accelerating belt being so positioned and arranged that said objects discharged from said entry plate follow a grazing trajectory onto said accelerating belt engaging said accelerating belt at a predetermined region,

a pinch roller of resilient material mounted above said accelerating belt at said predetermined region for pressing said objects against the surface of said accelerating belt,



said pinch roller being rotated with a peripheral speed equal to said second predetermined speed,

a guide belt mounted above said accelerating belt on rollers, one of said rollers being at one end of said guide belt adjacent said pinch roller and being of resilient material, said guide belt moving at said second predetermined speed,

the surface of said guide belt diverging from the surface of said accelerating belt towards the end of said guide belt away from said one end, the surface of said guide belt facing said accelerating belt towards said one end pressing back against said accelerating belt any of said objects tending to have a component of velocity away from the surface of said accelerating belt,

said accelerating belt providing a discharge of said objects in a spaced arrangement.

3,908,815

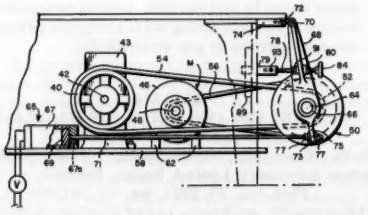
SPEED CONTROL FOR LABELING MACHINES

Sidney T. Carter, Shrewsbury, Mass., assignor to A-T-O Inc., Cleveland, Ohio

Filed Nov. 12, 1973, Ser. No. 414,816

Int. Cl.[2] B65G *43/08*

U.S. Cl. 198—37 **34 Claims**



1. Apparatus for processing containers comprising instrumentalities arranged along a predetermined path, means for moving containers along said path, a drive shaft and driving connections therefrom to the instrumentalities and the means for moving the containers along said path, speed change means connected to the drive shaft, and a detector arranged to detect the presence or absence of containers moving along said path and in response to an absence of containers to effect operation of said speed change means; characterized in that the speed change means comprised a variable diameter input pulley, a constant diameter output pulley fixed to the drive shaft, intermediate pulleys, rotation of which is imparted thereto by the input pulley and rotation of which imparts rotation to the output pulley, means supporting said intermediate pulleys for rotation in unison and movement relative to the input and output pulleys and comprising a constant diameter pulley and a variable diameter pulley and belts of predetermined fixed lengths drivably connecting respectively the input pulley to one of the intermediate pulleys and the output pulley to the other of the intermediate pulleys.

3,908,816

CONVEYOR DEVICE

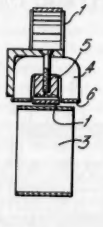
Douglas Harold Brain, Giffnock, Scotland, assignor to J. & P. Coats Limited, Glasgow, Scotland

Continuation of Ser. No. 246,164, April 21, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 446,953

Claims priority, application United Kingdom, Apr. 22, 1971, 10772/71; July 28, 1971, 35356/71

Int. Cl.[2] B65G *17/46*

U.S. Cl. 198—41 **5 Claims**



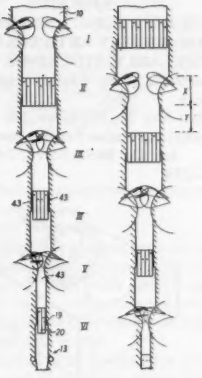
1. A conveyor device of the moving belt type incorporating two belts arranged with a flight of each parallel to and adjacent a flight of the other, at least one of the belts being a driving belt, one belt being of non-magnetic material and the other belt being of such a construction that it is attracted toward the source of a magnetic field, magnet pole pieces spaced longitudinally of the adjacent flights of the belts and transversely apart so as to lie adjacent and along the opposite marginal portions of the adjacent flights of the belts and on the side of the flight of the belt of non-magnetic material remote from the other belt, and a slipper bar disposed longitudinally of the belts between the transversely spaced magnetic poles adjacent the belt of non-magnetic material, a portion of the adjacent flight of the belt of non-magnetic material being slidingly engageable with the slipper bar, the width of the non-magnetic belt being less than the transverse distance between said pole pieces such that the portion of the non-magnetic belt engaged with the slipper bar lies between the transversely spaced pole pieces, the surface of the non-magnetic belt presented to the other belt occupying a position beyond the surface of the pole pieces presented to the said other belt a distance less than the thickness of the non-magnetic belt.

3,908,817

DISPENSING OF PARTICULATE MATERIAL

Richard Ernest Gartside Neville, Salisbury, and Frank Baxter Bardsley, Newton Toney, near Salisbury, all of England, assignors to AMF Incorporated, White Plains, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,126
Claims priority, application United Kingdom, Dec. 7, 1972, 56623/72
Int. Cl. B65g *37/00*
U.S. Cl. 198—76 17 Claims



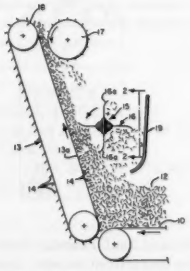
1. A cut tobacco feeding device comprising a passage formed by a series of sections decreasing consecutively in cross-sectional area and means at each section for advancing the tobacco along said passage towards the low cross-sectional area end thereof, each of said means having forward and rearward oscillating projections which enter the tobacco during advance with said forward projection moving faster and having a longer stroke than said rearward projection to effect a drawing out of the tobacco in the direction of advance at each section.

3,908,818

LOADER FOR PIN ELEVATOR

Donald W. Selby, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 26, 1973, Ser. No. 400,908
Int. Cl.² B65G *15/22*
U.S. Cl. 198—161 3 Claims



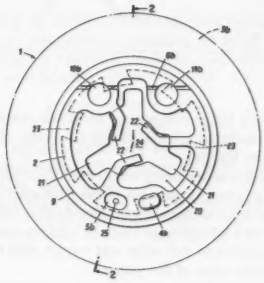
1. In an elevator for staple fibers including an endless driven belt having an upward moving reach with pins attached thereto for moving said fibers upward from a source of fiber stock presented to the pins the improvement comprising: a driven rotating elongated member positioned adjacent said upward reach, said member extending substantially horizontally across the full width of the upward moving reach of said belt; and a plurality of flexible curved strips extending radially from said member, said strips have convex surfaces at their ends, said surfaces being presented to the fibers held by the pins on said upward reach; and a fixed baffle positioned adjacent said member, said member being between said upward moving reach and said baffle, said baffle curving below said member toward said upward moving reach for retaining staple fibers in the vicinity of said curved flexible strips.

3,908,819

TYPEWRITER RIBBON SPOOL HAVING CONGRUENT HALVES FORMED OF PLASTIC AND METAL

Michel Albert Gely, Luzancy, France, assignor to Kores Holding Zug AG, Zug, Switzerland

Filed July 3, 1973, Ser. No. 376,158
Claims priority, application Austria, July 31, 1972, 6572/72
Int. Cl.² B41J *35/00*
U.S. Cl. 197—175 4 Claims



1. In an ink ribbon spool comprising two spool halves, each spool half including a hub portion and a flange, wherein the two spool halves have congruent form, a casing of each hub portion extending to a mid-line of an ink ribbon to be wound onto the spool, each hub portion being made from plastic material, the improvement wherein each flange is made of sheet metal and has dovetail shaped projections directed radially inward for being embedded in and anchored to the hub portion; each hub portion being provided with at least one pin arranged parallel to the spool axis and protruding over the jointing plane of the spool halves, and with first recesses corresponding to the pins and equal in number; the pins and the first recesses being arranged eccentrically to an axis of the spool; and the spool halves being connected at the hub portions by fitting the pins into the first recesses.

3,908,820

TYPEWRITER SIGNAL DEVICE FOR INDICATING LAST LINE TO BE TYPED

Wilburn W. Wood, 2714 N.E. 119th St., Vancouver, Wash. 98665

Filed Nov. 16, 1973, Ser. No. 416,377
Int. Cl.² B41J *29/44*; B65H *25/14*; G08B *21/00*
U.S. Cl. 197—189 1 Claim

1. A signal device for typewriters to indicate when a sheet of paper has been typed to the desired distance from the bottom, comprising

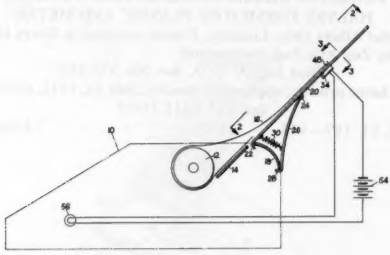
a. a paper guide,

b. means arranged to mount said paper guide on a typewriter such that a sheet of paper being typed upon slides flatwise up the guide,

c. means defining a longitudinal slot in said paper guide,

d. an electric circuit having a source of potential,

e. a switch in said circuit,
f. a housing enclosing said switch having forward and rearward ends and opposite sides,
g. said switch having a pair of contact strips of electrically conducting material,
h. said contact strips projecting upwardly from said housing with one of said strips being stationary and the other strip being movable,
i. said movable strip being forward of said stationary strip and being movable rearwardly into contact with said stationary strip when engaged by a leading edge of a sheet of paper moving up the guide,



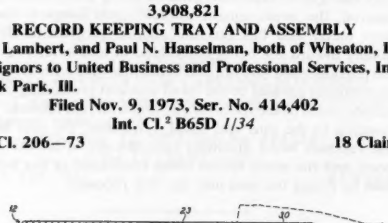
j. one of said strips comprising bendable material and having an insulated U-shaped bend around the other strip within the housing,
k. said contact strips being connected together in said housing by pressed engagement of the U-shaped portion of the said one strip in clamping engagement on the other strip,
l. means on said opposite sides of said housing supporting the latter in said slot with said switch arm in the path of the leading edge of the paper,
m. said housing being longitudinally adjustable in said slot to position said switch arm a selected distance up the guide,
n. and a signal device in said circuit energized by the closing of said switch to warn the typist that the last line to be typed has been reached.

3,908,821

RECORD KEEPING TRAY AND ASSEMBLY

Gray Lambert, and Paul N. Hanselman, both of Wheaton, Ill., assignors to United Business and Professional Services, Inc., Oak Park, Ill.

Filed Nov. 9, 1973, Ser. No. 414,402
Int. Cl.[2] B65D *1/34*
U.S. Cl. 206—73 **18 Claims**



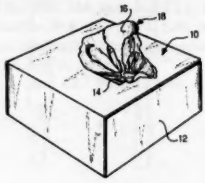
1. A record keeping tray having a bottom wall and upstanding connected front, rear and side walls, and comprising:
divider means supported on said bottom wall and providing upwardly extending spaced dividers with ends at one of said side walls and opposite ends spaced from the other side wall;
and a filler mounted between said other side wall and the those ends of the dividers which are spaced from said other side wall;
said filler defining together with one of the dividers which is adjacently spaced from said rear wall an upwardly opening record-receiving slot having its opposite ends at said side walls;
said dividers defining upwardly opening record-receiving pockets shorter than said slot and closed at one end by said one side wall and at the opposite end by said filler.

3,908,822

DEVICE FOR PACKAGING AND PRESENTATION OF KNITTED OR HOSIERY ARTICLES SUCH AS, MORE PARTICULARLY, STOCKINGS OR TIGHTS

Bernard Giberstein, Paris, France, assignor to Dim-Rosy, Autun, France

Filed May 23, 1974, Ser. No. 472,702
Claims priority, application France, June 8, 1973, 73.21072
Int. Cl.[2] B65D *85/18, 73/00*
U.S. Cl. 206—278 **6 Claims**



1. A packaging and presentation assembly comprising a closed package having a surface provided with an opening; a hosiery article formed from a given fabric and contained in said closed package; and a packaging bag contained in said package and containing said hosiery article, said packaging bag having a mouth being formed from said fabric, said portion extending outwardly through said opening provided in said closed package.

3,908,823

VISUAL MERCHANDISER FOR SHIRT AND NECKTIE

Ernest D. Smith, 1630 Prairie, Elkhart, Ind. 46514

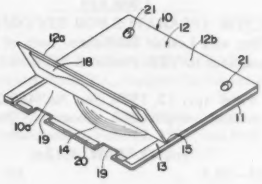
Filed Aug. 6, 1973, Ser. No. 385,723
Int. Cl.[2] B65D *85/18*
U.S. Cl. 206—292 **8 Claims**

1. A shirt, necktie, and a display device therefor comprising a back member and a front member overlying the back member in a spaced yet substantially parallel relation, the shirt positioned between the front and back members, the front member having an outside edge defining a tongue supporting a fold or knot of the necktie adjacent to the collar of the shirt and having an inside edge defining an aperture receiving at least one end of the necktie.

3,908,824
RECORD PROTECTIVE JACKET

Ichiro Takahara, Kadoma; Tadahiko Yabu, and Takashi Miwa, both of Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Feb. 6, 1974, Ser. No. 440,198
Claims priority, application Japan, Feb. 9, 1973, 48-17324
Int. Cl.² B65D *85/30*
U.S. Cl. 206—312 **1 Claim**



1. A protective jacket for accommodating therein a flexible foil-type disc record comprising:

first and second plate members;

a substantially U-shaped spacer secured to said first and second plate members thereby joining said first and second plate members to each other while forming a chamber therebetween for receiving therein said disc record through an opening defined between said first and second plate members and said spacer;

a lid provided in the first plate member for selectively closing and opening said chamber to enable the disc record to be confined within said chamber and to be taken out of said chamber, respectively;

hinge means for hingedly supporting said lid to said first plate member, said hinge means being positioned on said first plate member to permit a portion of the disc record to be exposed to the outside of the protective jacket when said lid is in position to open said chamber;

at least one pair of access openings formed in a spaced relation to each other in one edge portion of said second plate member adjacent said opening defined by said first and second plate members and said spacer, each of said access openings terminating at a position which is adjacent the outer periphery of the disc record accommodated within said chamber and which does not overlap said outer periphery of said disc record; and

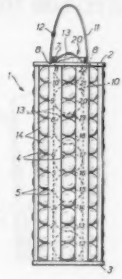
separate means for connecting said lid to said second plate member thereby substantially sealing the opening of said chamber, a portion of said second plate member which is opposed to said separate means being flush with the inside surface of said second plate member while a corresponding portion of said first plate member which faces said portion of said second plate member is projected towards said second plate member a distance corresponding to the thickness of said spacer.

3,908,825
MARBLE-CARRIER CASE

Robert Ayoub, and Raymond Ayoub, both of 12 Bis, avenue Jean Perrot, 38100 Grenoble, France

Filed July 5, 1973, Ser. No. 376,907
Int. Cl.² B65D *83/04, 85/58*
U.S. Cl. 206—315 **3 Claims**

1. A marble-carrier case comprising a vertical barrel having a plurality of longitudinal chambers and provided with two end-plates, the transverse section profile of said chambers covering an arc greater than half the perimeter of the marbles in order to hold them imprisoned, one of said plates being rotatably mounted and comprising at least one peripheral slot adapted to be brought selectively into correspondence with said longitudinal chambers in such manner as to provide access to the selected chamber, either for the purpose of making a stack of marbles or for removing at least one of said marbles which are held imprisoned, said one plate having a central orifice having a diameter at least equal to a central bore formed in said barrel, one extremity of said central bore of

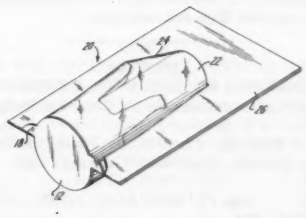


said barrel being closed by a fixed end plate, while the opposite extremity of said bore is extended to form an annular projection forming a retention centering and rotational guiding means for said pivoted plate.

3,908,826
VISUAL DISPLAY PACKAGE

Rudolph A. Faller, Edina, Minn., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed June 29, 1973, Ser. No. 374,925
Int. Cl.² B65D *73/00*
U.S. Cl. 206—463 **9 Claims**



1. A visual display package, including an article within said package, comprising:

a sheet of foldable paperboard formed with a window region therethrough adapted for receiving said article;

a sheet of transparent material overlying at least said window region in said paperboard sheet, said sheet of transparent material being formed with an article receiving recess within said window region;

a fold line extending across said sheet of paperboard intermediate the ends thereof and defining two sections therein;

said sheet of paperboard being folded about said article on said fold line;

means for securing said sections of said sheet of paperboard on opposite sides of said fold line into juxtaposition with one another;

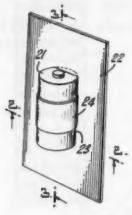
an article support region of said paperboard located within said window region and hingedly secured to said sheet of paperboard at said fold line by hinge members which extend from the sides of said support region and permit rotational movement of said support region; and

said article support region being in a flush relation to the base surface of said article and formed in size to provide lateral stability to said package when placed on a supporting surface.

3,908,827
CARDED PACKAGE

Cyrus W. Bemmels, and Guy J. Crocker, both of North Brunswick, N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 23, 1973, Ser. No. 418,648
Int. Cl.² B65D 73/00
U.S. Cl. 206—478 17 Claims

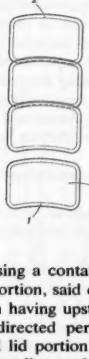


1. A carded package which comprises; a packaging card; a packaged article positioned on one side of the card; opposed flaps in contact with opposite sides of the packaged article, said flaps being foldably connected to and bent away from the plane of said card and each of said flaps defining one edge of an opening in said card between them, and said opening having a dimension less than that of the packaged article in at least one direction parallel to said card; and a length of tape adhered to the outwardly facing surface of each of said flaps and embracing the packaged article between the flaps, said tape holding said flaps in contact with opposite sides flaps, said tape holding said flaps in contact with opposite sides of the packaged article and being in closed contact with the surface of said article between said flaps; whereby said article is held in position in said package between and in contact with said card and said flaps and said tape.

3,908,828
CONTAINER FOR FOODSTUFF OR OTHER MATERIAL

Kurt Lohwasser, Milchstrasse 22, 2000 Hamburg, 13, Germany

Filed Apr. 17, 1973, Ser. No. 351,887
Claims priority, application Germany, Apr. 21, 1972, 2219741
Int. Cl.² B65D 85/62, 21/02
U.S. Cl. 206—504 1 Claim

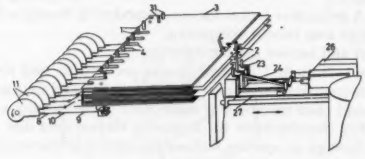


1. A container comprising a container portion having an opening closed by a lid portion, said container portion comprising a flat base portion having upstanding peripheral side walls having outwardly directed peripheral flanges at the upper edges thereof, said lid portion being secured to said peripheral flanges and extending to the edges of the flanges, one of said side walls of two opposed side walls being of greater height than the other so that the plane of the lid and peripheral flanges is inclined to the plane of the base, said two opposed side walls being longer than the side walls interconnecting said two opposed side walls, one of said two opposed side walls being concave in plan view and the other of said two side walls being convex in plan view with respect to the interior of the container, whereby a series of such containers can be laterally adjacently disposed with said flanges overlapping and with said convex side wall of one container tightly fitting against the concave side wall of an adjacent container.

3,908,829
SELECTOR APPARATUS FOR RECORD SHEETS

Frank Müller, and Lothar Hoffmann, both of Dresden, Germany, assignors to VEB Pentacon Dresden, Dresden, Germany

Filed Apr. 12, 1974, Ser. No. 460,275
Claims priority, application Germany, June 13, 1973, 171494
Int. Cl.² B07C 5/12
U.S. Cl. 209—80.5 12 Claims



1. In an apparatus for removing a desired record sheet from a stack of such sheets laid horizontally one upon another, each of said sheets having thereon identification means selected from the group consisting of slots, notches and holes, said apparatus comprising a housing and means within said housing for supporting said stack, the provision of:

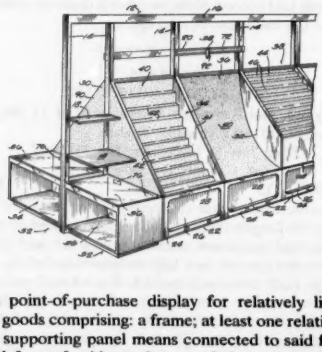
a. a plurality of vertical selection pins positioned within the housing and movable vertically for engagement in said identification means; and

b. means for moving one or more of said selector pins horizontally according to the record sheet desired, to remove said desired record sheet from said stack, wherein the selector pins are arranged in several groups for the removal of said desired record sheet by stages.

3,908,830
DISPLAY DEVICE

David S. Skrzelowski, Grand Haven, Mich., assignor to Harbor Industries Incorporated, Grand Haven, Mich.

Filed Feb. 21, 1973, Ser. No. 334,480
Int. Cl.² A47F 5/00
U.S. Cl. 211—55 18 Claims



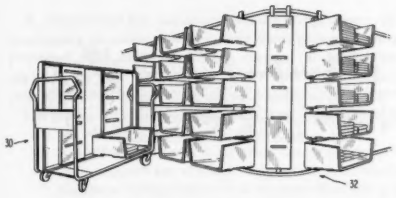
1. A point-of-purchase display for relatively lightweight display goods comprising: a frame; at least one relatively large display supporting panel means connected to said frame, the exposed face of said panel means being substantially com-

pletely covered by a pile fabric having loop elements; at least one moveable display support including means specifically for holding the display goods, said display support having a rear surface; at least one strip of material having a plurality of resiliently deformable hook shaped elements incorporated therewith, said one strip being affixed to the rear surface of said display support whereby said display support can be removably and selectively affixed to the exposed face of said panel by pressing said hook shaped elements into removable entanglement with said loop elements.

3,908,831
MODULAR STORAGE SYSTEM

Thomas Brendgord, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Aug. 7, 1972, Ser. No. 278,360The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.
Int. Cl.[2] A47F *3/14, 5/08*
U.S. Cl. 211—88 **10 Claims**



1. In combination, support structure means and interconnecting unit means,

the support structure means comprising

elongated vertically-oriented support means presenting a substantially vertical frontal interface with a substantially vertical sidewall extending rearwardly from each lateral edge of the frontal interface,

the frontal interface defining a plurality of elongated slots extending in a direction across such interface between its lateral edges and predeterminedly spaced longitudinally along such support means,

horizontally-oriented load support means located at each such slot, and

means for maintaining such elongated support means in an upright position,

the interconnecting unit means comprising

rigid base means with elongated hanger means and stabilizing means projecting in the same direction from the rigid base means,

the elongated hanger means and stabilizing means being positioned in predetermined fixed relationship on such base means with the hanger means horizontally-oriented at a location upwardly spaced from the stabilizing means when the base means is in an upright position,

the elongated hanger means having a longitudinal dimension at a location contiguous to the rigid base means approximately equal to the longitudinal dimension of the elongated slot means, and

the elements of the interconnecting unit, when in an upright position, coacting with such support structure means to removably position and stabilize the interconnecting unit on the upright support structure with the elongated hanger means inserted into the elongated slot means and suspended cantilever fashion on the horizontally extending load support ledge means with lateral contact surfaces of the stabilizing means contacting lateral surfaces in angled relationship to the frontal interface of the support structure means to provide lateral stability.

3,908,832
DISPLAY STAND

John Marshall, 13, Wharf Rd., London N1 7SA, England

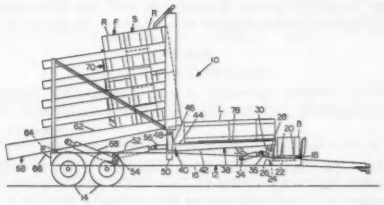
Filed Jan. 14, 1974, Ser. No. 432,937
Claims priority, application United Kingdom, Jan. 16, 1973, 2336/73
Int. Cl.[2] A47F *3/14, 5/00*
U.S. Cl. 211—133 **5 Claims**

1. A stand for periodicals comprising a frame supporting a plurality of trays, each of said trays being arranged to directly support a periodical thereon, said frame comprising at least one upright post, each periodical tray comprising a lateral flange including a front edge and a rear edge, said front edge extending at an angle to said rear edge, and a planar body portion having a side edge and a lower edge, with a lip projecting from said lower edge, said planar body being of sufficient width to directly support a periodical, the front edge of said lateral flange being connected to said planar portion at said side edge with said flange being disposed normally to said planar portion, said flange being secured to one side of the upright post with the portion of the flange adjacent the back edge being abutted against said side, whereupon the planar body of the tray extends downwardly away from the upright at an acute angle thereto.

3,908,833
METHOD AND APPARATUS FOR FORMING A PAIR OF TWO AND ONE-HALF BALE WIDE TIER PATTERNS

Anthony E. Furtado, Riverdale; Thomas H. Wadsworth, Selma, and L. Dennis Butler, Kingsburg, all of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed May 24, 1974, Ser. No. 473,242
Int. Cl.[2] B65G *57/32*
U.S. Cl. 214—6 B **16 Claims**



1. A method of forming bales on a bale wagon into a tier pattern being approximately two and one-half bales wide, said bale wagon having a pivotally-mounted tier-forming table, a pivotally-mounted bale-receiving table positioned forwardly along a bale-receivingg end of said tier-forming table and an elongated platform having a length and width generally corresponding to that of a pair of bales being arranged end-to-end in a row and being pivotally mounted at its one end adjacent one of two opposite sides, and said bale-receiving end, of said tier-forming table through a distance from the other of said sides of said tier-forming table approximately equal to the length of two and one-half bales, comprising the steps of:

pivotally moving said tier-forming table to a horizontal position, said movement of said tier-forming table actuating said platform to pivotally move to a forward position along said bale-receiving end of said tier-forming table;

pivotally moving said bale-receiving table from a horizontal position to a generally upright position when one pair of bales has been received on said bale-receiving table in a transverse position aligned with said platform for placing said one pair on said platform;

pivotally moving said bale-receiving table from its upright position back to its horizontal position, said movement of said bale-receiving table actuating said platform to pivotally move with said one pair of bales thereon from its forward position to a side position along said one side of said tier-forming table for disposing said one pair in a longitudinal position to thereby form a pair of rail bales of said tier pattern on said tier-forming table;

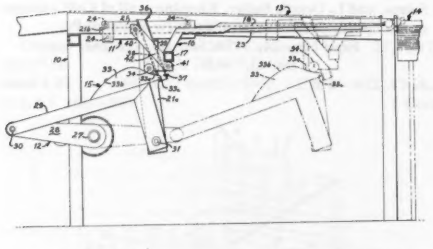
maintaining said platform at its side position along said one side of said tier-forming table; and

successively pivotally moving said bale-receiving table from its horizontal position to its upright position and back to its horizontal position as pairs of bales in a plurality thereof, being like said one pair, are successively received on said bale-receiving table in another transverse position therealong, being offset from said transverse position of said one pair and aligned between said other side of said tier-forming table and longitudinal side of said pair of rail bales facing said other side of said tier-forming table, for successively placing said like pair in said plurality thereof on said tier-forming table in transverse relationships along said one longitudinal side of said pair of rail bales of said tier pattern and generally between opposite ends thereof to thereby complete the formation of said tier pattern on said tier-forming table.

3,908,834
GUIDE MEANS FOR LUMBER STACKING MACHINE

Sidney L. Lunden, Spokane, Wash., assignor to Moore-Iem, Inc., Spokane, Wash.

Filed Apr. 1, 1974, Ser. No. 456,754
Int. Cl.² B65G *57/10, 57/20*
U.S. Cl. 214—6 DK **3 Claims**



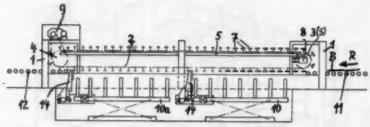
1. In a lumber stacking apparatus including a crank drive means for reciprocating a carriage in forward and rearward strokes between a course pickup station and a course stacking station and elevating means for vertically moving a course support means on the carriage to (a) raise a course of boards at the course pickup station, (b) lower the course in front of layer stripping members and (c) maintain the lowered condition as the carriage is moved rearwardly to strip the course onto a stack, an improvement comprising:

guide means interconnecting the course support means and the carriage for guiding the course support means upward and rearwardly, with respect to the carriage at the course pickup station as the elevating means raises the course support means and for guiding the course support means downward and forwardly at the stacking station as the elevating means lowers the course support means; wherein the guide means includes (1) opposed parallel planar cam surfaces and is mounted to the carriage so the cam surfaces face forward and rearward, the cam surfaces being inclined upward and rearward with respect to a vertical reference plane; and (2) a pair of vertically spaced rollers engaging the respective cam surfaces and mounted to the course support means for rotation about fixed horizontal axes.

3,908,835
APPARATUS FOR CONTINUOUSLY CONVEYING AND/OR STACKING SHEET-LIKE ARTICLES, PARTICULARLY SHEET-METAL

Egon Lubas, Nievenheim-Ueckerath, Germany, assignor to HWM Hermann Weg Maschinenfabrik K.G., Dusseldorf-Heerdt, Germany

Filed June 12, 1973, Ser. No. 369,162
Claims priority, application Germany, June 13, 1972, 2228726
Int. Cl.² B65G *57/00;* **B23Q** *05/22;* **B65H** *29/32*
U.S. Cl. 214—6 FS **13 Claims**



1. Apparatus for continuously conveying sheet-like articles, said apparatus comprising, in combination, endless conveyor means arranged for movement in a predetermined path of travel, said conveyor means comprising a plurality of transverse members including groups of vacuum-operated, suction cups, said transverse members being spaced equidistantly from each other on said conveyor means;

drive means operatively connected to said conveyor means for moving the transverse members along the path of travel;

at least one stacking station below said path of travel over which the transverse members pass;

control means operatively connected to the transverse members and suction cups for controlling gripping-operation of the suction cups in relation to the articles being conveyed; and

vacuum supply means operatively connectable to said transverse members and said vacuum cups for connecting said transverse members and suction cups to a vacuum source, the conveyor means including a pair of spaced pulleys over which the endless conveyor is entrained, said vacuum supply means comprising a rotatable member driven in synchronization with one of said pulleys, said rotatable supply means comprising supply pipe elements extending angularly in radially extending relation from the axis of rotation thereof and terminating a chordal distance with respect to each other substantially equal to the spacing of the transverse members for sequentially engaging the transverse members as the rotatable supply means and transverse members move in unison and in a common direction, said supply pipe elements and transverse members including cooperating valve means opened through engagement between said supply pipe elements and said transverse members moving through a predetermined angle of engagement during synchronized movement for evacuating the transverse members during such engagement; and conduit means connecting the transverse members to each other whereby when transverse members are being evacuated at said supply pipe elements those suction cups engaging an article will grip the articles to be conveyed.

3,908,836

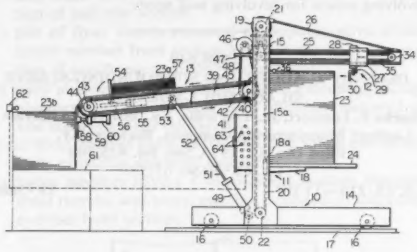
APPARATUS FOR SUPPLYING SHEETS TO A SHEET PROCESSING MACHINE IN SUCCESSIVE STACKS

Takashi Ikeda, 270, Aza-Michihigashi, Kohiji, Yaizu, Shizuoka, Japan

Filed May 1, 1974, Ser. No. 465,933

Int. Cl.² B65G *59/02*

U.S. Cl. 214—8.5 F **5 Claims**



1. Apparatus for successively supplying sheets to a sheet processing machine, wherein said sheet processing machine is provided with sheet receiving means on which the sheets supplied by said apparatus can be successively stacked up, said apparatus comprising in combination:

I. a frame including an upright support having an aperture;

II. an elevator mechanism including

a. a platform slidably supported on one side of said upright support for vertical reciprocation therealong, said platform being adapted to receive thereon a stack of sheets to be supplied to said sheet processing machine, and

b. first drive means for causing said platform to reciprocate vertically along said upright support;

III. a sheet feed mechanism including

a. a guide beam extending horizontally at said one side of the upright support and located above said platform of said elevator mechanism,

b. a carriage slidably mounted on said guide beam for horizontal reciprocation therealong,

c. a push member supported by said carriage, and

d. a second drive means for causing said carriage to reciprocate horizontally along said guide beam, whereby each time said push member travels forwardly toward said upright support from the remote end of said guide beam, a prescribed number of sheets on said platform can be fed in the form of a stack into and through said aperture formed through said upright support;

IV. a conveyor mechanism including

a. parallel spaced side frames supported on the other side of said upright support,

b. a plurality of parallel space endless belts extending in coplanar relationship around terminal pulleys rotatably supported at both ends of said side frames, said endless belts being adapted to receive at one extremities thereof each prescribed number of sheets delivered through said aperture of said upright support by said feed mechanism, and

c. third drive means for causing said endless belts to move around said terminal pulleys, whereby each prescribed number of sheets loaded on said endless belts at one extremities thereof are thereby transported toward the other extremities;

V. a plurality of stop members pivotally supported at their proximal ends on said conveyor mechanism adjacent said other extremities of said endless belts and aligned with respect to each other transversely of said conveyor mechanism, each of said stop members being pivotable between an upright position above the upper runs of said endless belts in which each prescribed number of sheets being transported by said conveyor mechanism is prevented from being fed by the conveyor mechanism, and a lying position in whichc it is swung toward said other extremities of said endless belts under the upper runs of the same;

VI. sheet stack detecting means provided on said conveyor mechanism upstream of said stop members to detect said prescribed number of sheets being transported on said endless belts to send a detection signal; and

VII. power means responsive to said detection signal to swing each of said stop members from its lying position to its upright position so as to temporarily arrest and stop said prescribed number of sheets being transported to readjust the same into a neat stack, said power means being swung thereafter into said lying position to allow said prescribed number of sheets to advance further to be unloaded onto said sheet receiving means.

3,908,837

REMOVAL OF MATERIAL FROM BULK STORAGE

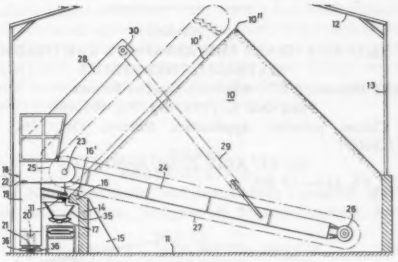
Gunter Strocker, Holzwickede, Germany, assignor to Gustav Schade Maschinenfabrik, Dortmund, Germany

Filed May 8, 1974, Ser. No. 467,929

Claims priority, application Germany, May 12, 1973, 2324058

Int. Cl.² B65G *65/28*

U.S. Cl. 214—10 **9 Claims**



6. Bulk storage means comprising a bulk storage dump, a dump delimiting wall having inner and outer faces and a material removing device moveable parallel to said wall and having a pivoted jib projecting over said wall and means for supporting and guiding said device consisting of: a first track beside and spaced from said outer face of said dump delimiting wall and a second track above said first track and on said dump delimiting wall and first and second wheel means on said device traveling on said first and second tracks respectively.

3,908,838

DRAGLINE CONVEYOR

Paul Hanss, Reichenbach, Baden, Germany, assignor to Elba Werk, Maschinen-Gesellschaft mbH & Co., Ettlingen, Baden, Germany

Filed Sept. 23, 1974, Ser. No. 508,614

Claims priority, application Germany, Sept. 21, 1973, 2347476

Int. Cl.² B65G *59/00*

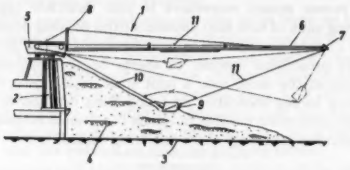
U.S. Cl. 214—10 **6 Claims**

1. An apparatus for self-actuated scooping-up of particulate material disposed in a sector-shaped storage space radially around a feeder and stored thereagainst having a rotatable chassis associated therewith including a derrick having a free end being hingeably attached thereto and traction and backhaul cables for the movement of a container via independent cable-portions guided via respective cable drums and switches controlling the drive of said respective cable-drums for the forward and rearward conveyance of said container comprising:

a guide pulley, said backhaul cable being prevented from being unwound and said cable drums including traction

and backhaul cable drums, said traction cable being only wound around said traction cable-drum until a length of said backhaul cable hanging from said guide pulley is used up; and

an active-supply partition separating a non-active supply of said particulate material from an active supply thereof, said backhaul cable-drum coupled to said traction cable-drum



being thereupon decoupled therefrom and upon said container reaching said partition said backhaul cable drum being arrested, said traction cable-drum being kept running, said traction and backhaul cables enclosing an angle, said container hovering above said storage space being returned to said free end of said derrick upon said angle substantially approaching 180° and said traction and backhaul cable-drums concurrently turning in opposite directions.

3,908,839

SILO AND MEANS FOR REMOVING PARTICULATE MATERIAL THEREFROM

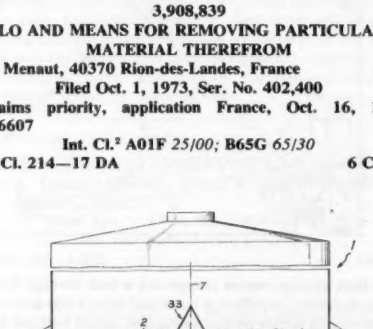
Jean Menaut, 40370 Rion-des-Landes, France

Filed Oct. 1, 1973, Ser. No. 402,400

Claims priority, application France, Oct. 16, 1972, 72.36607

Int. Cl.² A01F *25/00*; **B65G** *65/30*

U.S. Cl. 214—17 DA **6 Claims**



1. A silo for storage of a material in particulate form including a container; a side wall and a circular floor to said container; a discharge port located centrally of said floor; an Archimedean screw horizontally disposed diametrically across the container adjacent the floor thereof and over the discharge port; said screw having flights of opposite pitches on opposite sides of the discharge port; first means mounting the screw for rotation about its own axis; means for driving the screw for rotation about its own axis; second means mounting the screw to extend diametrically across said floor and for movement sweeping the floor of the silo; means for revolving the screw about the vertical axis of the silo for sweeping movement in such manner that the flights are able to drive particulate material contained in the silo towards said discharge port during operation of the said rotation drive means and the revolving means; said revolving means comprising bearings mounted for circular orbiting motion about a vertical axis substantially coaxial of said circular floor and the Archimedean screw having ends projecting outwardly beyond said side wall of the container and mounted in said bearings; a stationary circular slideway coaxial with said vertical axis; a common intermediate support mounted on said slideway for rotation about said vertical axis; said bearings of the Archimedean screw being attached to said common intermediate support and said means for rotating the screw about its own axis being carried by said common intermediate support; and means for rotatably connecting said intermediate support means to said revolving means for revolving said screw.

3,908,840

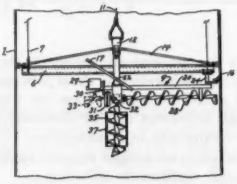
DEPENDING-AUGER AND SURROUNDING-SLEEVE SILAGE HOLE-FORMER

Charles F. Lambert, Jr., Louisville, Ky., assignor to Clayton & Lambert Manufacturing Company, Buckner, Ky.

Filed Dec. 17, 1973, Ser. No. 425,308

Int. Cl.² B65G *65/38*

U.S. Cl. 214—17 DB **12 Claims**



11. An improved silage discharge-hole-former for use in a silo on a horizontal rotary sweep of the spreading/unloading type, which is mountable in the silo for raising and lowering movement during silo-filling and unloading operations and for sweep rotation relative thereto about a vertical axis, comprising:

A. an open-ended sleeve mountable to depend from the rotary sweep in concentric relation to said vertical axis and operative, when mounted,

1. to rise with the silage-spreading sweep, during a silo-filling operation, to form an axially open-ended silage discharge hole that rises upwardly entirely through the rising column of silage from the bottom of that column, and

2. to descend with the silage-unloading sweep, during a silo-unloading operation, to receive the unloading silage and direct it downwardly toward the open bottom of said discharge hole; and

B. means for restricting the flow of incoming silage downwardly through said discharge hole during the filling operation and for promoting the flow of outgoing silage during the unloading operation,

1. said means including an auger vertically arranged within the sleeve for contemporaneous rising and lowering movement therewith and for horizontal rotation relative thereto during the unloading operation, said auger rotation being in a direction promoting the downward flow of the unloading silage.

3,908,841

ARTICULATED HAULAGE VEHICLE

Arthur L. Lee, and Arthur B. Coval, both of Columbus, Ohio, assignors to FMC Corporation, Chicago, Ill.

Division of Ser. No. 347,646, April 4, 1973, abandoned. This application Aug. 14, 1974, Ser. No. 497,267

Int. Cl.² B60P *1/38*

U.S. Cl. 214—83.36 **6 Claims**

1. An articulated haulage vehicle comprising,

a frame member having a front section and a rear section, each of said sections having a front portion and a rear portion,

means connecting said frame member front section to said frame member rear section including connecting means to permit articulation between said frame sections in a plurality of different planes,

a pair of rear wheels mounted on opposite sides of said frame member rear section adjacent the rear portion of said frame member rear section,

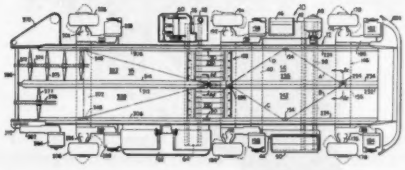
a pair of intermediate wheels mounted on opposite sides of said frame member rear section adjacent the front portion of said rear section,

a pair of front wheels mounted on opposite sides of said frame member front section adjacent the front end portion of said frame member front section,

a body member having a longitudinally extending haulage compartment therein, said body member mounted on said frame member rear section,

said body member having a floor portion with a pair of side walls extending upwardly therefrom,

a boom member having a longitudinal haulage compartment therein, said boom member mounted on said frame member front section,



said boom member having a floor portion with a pair of spaced side walls extending upwardly therefrom,

flexible means connecting said boom member to said body member including means to permit articulation between said body member and boom member in a plurality of different planes and forming an elongated longitudinal haulage compartment whereby said means connecting said frame member front section to said frame member rear section and said flexible means connecting said boom member to said body member permits the vehicle to articulate in a plurality of planes and thus follow the contour of uneven terrain while all of the propelling wheels remain in contact with the ground as the vehicle moves over uneven terrain, and

endless conveyor means extending along the surfaces of said boom member floor portion and said body member floor portion, said endless conveyor means arranged to convey material in said elongated longitudinal haulage compartment.

3,908,842

TOW TRUCK

William Place, 8 Tower Road, Lexington, Mass. 02173

Filed May 18, 1973, Ser. No. 361,803

Int. Cl.² B60P *3/12*

U.S. Cl. 214—86 A **8 Claims**

1. In a combination truck, the improvement comprising, in combination:

a frame;

a horizontal bed supported on the frame;

the frame including means defining a longitudinally extending well below the bed;

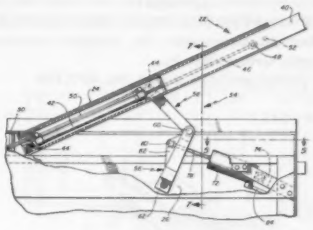
a boom disposed longitudinally in the truck and being pivoted at its forward end to the frame below the bed, the rearward end of the boom being adapted to be pivoted about the pivot between a lowered position within the well and a raised position;

scissors jack linkage means mounted to the frame at a location between the pivot and the rearward location of the rear axle of the truck for raising and lowering the boom, the scissors jack linkage means being further constructed and arranged to receive a downwardly directed load applied to the boom and to direct the load to the frame along a direction which is forward of the rear axle of the truck;

the scissors jack linkage means further comprising:

upper linkage means pivoted at its upper end to said boom;

lower linkage means pivoted at its lower end to said frame;



the free ends of said upper and lower linkage means being pivoted to each other at a common pivot, said common pivot being disposed rearwardly of said upper pivots; and

means mounted to the frame of the truck for operating said linkage means and comprising a hydraulic cylinder pivoted at its rearward end to the frame of the vehicle and having a substantially forwardly extending piston rod, said piston rod being pivoted to said lower linkage means at a location within the angle defined between said common pivot and said upper and lower pivots.

3,908,843

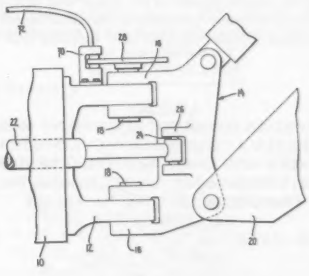
BRAKE SYSTEM

Fred W. Noller, Northville, and James Leroy Campbell, Westland, both of Mich., assignors to Massey-Ferguson, Inc., Detroit, Mich.

Filed Feb. 21, 1974, Ser. No. 444,615

Int. Cl.² E02F *3/32*

U.S. Cl. 214—138 **3 Claims**



1. In a vehicle having a boom swingable to the side of the vehicle for supporting working implements, a brake system including a base mounted on the vehicle, a swingable boom support mounted on the base, an actuator interconnecting the base and the support for providing relative movement therebetween, means for stopping the relative movement including a selective engaging member mounted on the base and an engageable member selectively engageable by the engaging member and mounted on the support, means for controlling said engaging member comprising: a directional valve for directing flow to said actuator, an energy source, and conduits interconnecting all the above for directing flow to said actuator to swing the boom, a second valve and an orifice, a con-

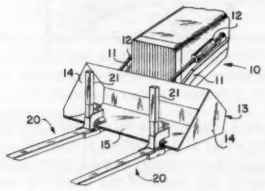
duit, containing said second valve and orifice, interconnecting said directional valve with said stopping means, said second valve preventing flow from said stopping means and said orifice restricting return flow to create a pressure differential to prevent sudden actuation of said stopping means when said directional valve is operated and to activate said stopping means when said directional valve is not in operation.

3,908,844

FORT ADAPTER FOR FRONT END LOADER

Cedric A. Duffield, Greencastle, Pa., assignor to Greencastle Metal Works, Greencastle, Pa.

Filed Apr. 3, 1974, Ser. No. 457,328
Int. Cl.² B66F *9/00*
U.S. Cl. 214—145 **10 Claims**



1. A fork adapter for the bucket of a front end loader comprising:

a linearly extending support member,

an upright post secured to said support member at the rear portion thereof and extending substantially perpendicularly thereto,

a frame comprising a pair of L-shaped plates on opposite sides of said support member and post, each having a first leg extending along a side of said support member and secured thereto and thence upwardly along and secured to a side of said post, each said frame plate further comprising a second leg extending rearwardly and above said support member,

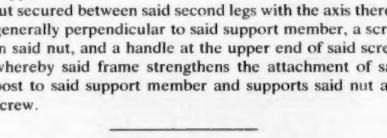
a nut secured between said second legs with the axis thereof generally perpendicular to said support member, a screw in said nut, and a handle at the upper end of said screw, whereby said frame strengthens the attachment of said post to said support member and supports said nut and screw.

3,908,845

MATERIALS HANDLING EQUIPMENT MORE PARTICULARLY A COMBINATION CYLINDRICAL PIPE HANDLE AND HOIST MOUNTING DEVICE

Alex W. Bolt, 1408 Richmond, Apt. 255, Houston, Tex. 77006

Filed Oct. 26, 1973, Ser. No. 410,213
Int. Cl.² B66F *9/18*
U.S. Cl. 214—147 R **1 Claim**



1. A pipe handling apparatus comprising in combination,

a hoisting and lifting apparatus,

a hoist mounting device which comprises a flange having a plurality of parallel rods connecting to and extending therefrom, means for rigidly connecting said flange to said hoisting and lifting apparatus, and

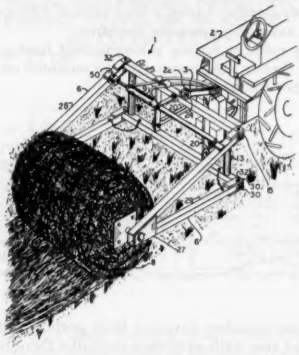
a cylindrical pipe handle which comprises a cylindrical body member having an inner end closure and an outer end closure, a plurality of parallel tubes passing through said outer end closure and connected to said inner end closure, said tubes being arranged and adapted to slidably mount on to said rods.

3,908,846

BALE HANDLING APPARATUS

Roger Brummitt, Rt. 1, Pollock, Mo. 63560

Filed Feb. 4, 1974, Ser. No. 439,557
Int. Cl.² B66C *1/44*
U.S. Cl. 214—147 G **5 Claims**



3. A bale handling apparatus mountable on an implement hitch of a farm tractor for grasping and selectively elevationally positioning a large bale, said apparatus including:

a. a frame structure having a pair of vertically spaced apart generally horizontal frame members having opposite free ends and a plurality of horizontally spaced apart generally vertical frame members secured to and extending between said horizontal frame members;

b. securing means on said frame adapted for securing same to an implement hitch of a farm tractor;

c. a pair of arms spaced apart and swingably mounted on said frame structure, said arms each having a free end spaced from said frame structure and having elongate arm members connected together adjacent the respective free end and diverging therefrom and terminating in vertically spaced end portions;

d. means pivotally mounting said spaced arm end portions to said free ends of the horizontal frame members for selectively swinging said arms and movement of the free ends toward and away from one another between closed and open positions;

e. a member freely rotatably mounted on each said arm adjacent the free end thereof with the member on one arm generally facing the member on the other said arm when said arms are in a substantially closed position;

f. at least one elongate bale penetrating member on each said rotatably mounted member with the bale penetrating member on one rotatably mounted member extending generally toward the bale penetrating member on the other said rotatably mounted member when said arms are in a substantially closed position;

g. selectively extendable and retractable ram means operably connected to said arms for selectively effecting the movement of said arms toward and away from one another with the movement toward one another for urging said bale penetrating members into penetrating engagement with opposite ends of a bale.

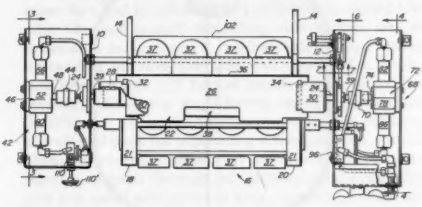
3,908,847
PNEUMATIC-POWERED GRIDDLE-LOADING MECHANISM

Eugene M. Noel, Newton Highlands, Mass., assignor to Alto Corporation, York, Pa.

Filed June 28, 1973, Ser. No. 374,332The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² B65B *21/02*

U.S. Cl. 214—314 **8 Claims**



1. A semi-automatic doughpiece loading mechanism for mounting on continuous process muffin griddles above a flight of moving griddle cups having a particular array thereon and using interchangeable trays with top panels provided with a like array of doughpiece cups therein comprising:

a. a frame having spaced frame members fixedly mounted on the continuous process griddle in transverse relation to the moving griddle flight thereunder;

b. a tray guide fixedly mounted between the spaced frame members in transverse relation thereto for guiding the insertion of a tray therein;

c. a tray locating station pivotally mounted between the spaced frame members in transverse relation thereto and in horizontal sliding relation thereon with the said tray guide for locating a tray with relation to the loading mechanism;

d. a top tray locating station rotary actuator mounted on the frame members for upending the tray locating station and a tray thereon for dumping the doughpieces therefrom;

e. a receiver assembly having an array of cups thereon like that of the said tray pivotally mounted between the spaced frame members in transverse relation thereto and in vertical relation with said tray locating station for receiving doughpieces dumped from said tray;

f. a bottom receiver assembly rotary actuator mounted on the frame members for upending the receiver assembly and the said cups thereon and dumping doughpieces therefrom; and

g. a coordinating means for coordinating, in time and space, the upending of the tray locating station and the upending of the receiver assembly with the flight of moving griddle cups below.

3,908,848
REFUSE COLLECTING AND DISPENSING VEHICLE

Willie F. Brewer, Clarion, Iowa, assignor to Hagie Manufacturing Company, Clarion, Iowa

Filed June 21, 1974, Ser. No. 481,640

Int. Cl.² B60P *1/28*

U.S. Cl. 214—508 **6 Claims**

1. A refuse collecting and dispensing vehicle comprising:

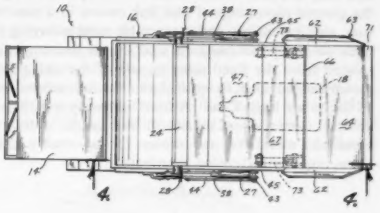
a. a portable frame having a forward end and a rear end,

b. a refuse carrying receptacle on said frame having an upwardly presented charging opening adjacent said forward end and a discharge opening at said rear end,

c. a pivoted cover means for normally closing said discharge opening,

d. a packer swingably mounted about a transverse axis at the rear edge of said charging opening and swingable downwardly through said opening and rearwardly toward said cover means to urge the refuse in the receptacle toward and compress the same against said cover means,

e. pivot means supporting said receptacle at the rear end of said frame for upward and rearward pivotal movement of the receptacle to a refuse dumping position,



f. a chute means,

g. coacting means on said cover means and chute means to form continuous side members for confining therebetween the refuse discharged from said discharge opening,

h. means adjustably supporting said chute means on said receptacle at a position rearwardly of said discharge opening, and

i. means for removing said chute means to an adjusted position relative to said discharge opening, when said receptacle is in a dumping position, to dispense refuse from the discharge opening to a refuse receiving station spaced rearwardly from and below the rear end of said receptacle.

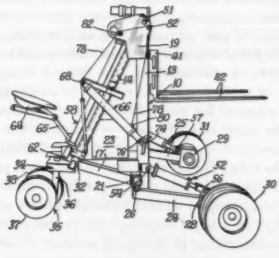
3,908,849
SELF PROPELLED UNLOADER

Henry F. Carroll, Cary, Ill., assignor to John Barchard, Crystal Lake, Ill., a part interest

Continuation of Ser. No. 345,742, March 28, 1973, Pat. No. 3,826,393. This application Apr. 1, 1974, Ser. No. 456,756The portion of the term of this patent subsequent to July 30, 1991, has been disclaimed.

Int. Cl.² B65G *47/00*

U.S. Cl. 214—672 **9 Claims**



3. A self propelled vehicle comprising a pair of generally rigid A-frames arranged in spaced apart relation and having the apices of said frames at the top thereof, fixed cross members joining the sides of said pair of rigid A-frames, a power source carried between said spaced apart A-frames, the corresponding one leg of each of said A-frames together constituting the front of said vehicle, the corresponding other leg of each of said A-frames together constituting the rear of said vehicle, a cross beam joining each of said A-frame legs constituting the front of said vehicle near their lower ends, spaced

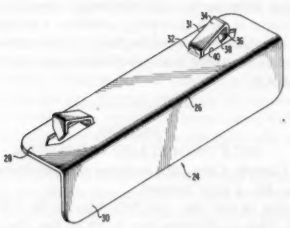
apart link means pivotally mounted by their one ends near the outer ends of said cross beam, transversely spaced apart motor housings, said spaced apart link means having their other ends affixed to and each carrying one of said spaced apart motor housings, a wheel carried on each of said motor housings, means imparting power from said power source to said motor housings to drive said wheels, extensible and retractable means for adjusting the angular disposition of the link members relative to the front of said vehicle, said extensible and retractable means having their one ends pivotally mounted on and near the ends of said cross beam at positions spaced from the pivotal mountings of said link means in a non-axial direction, said extensible and retractable means having their other ends pivotally mounted on said motor housings at positions spaced from the fixed attachments of the link means to said motor housings, an extension member telescoped within each of the other legs of said A-frame constituting the rear of the vehicle, caster wheel means carried on the outer end of said extension members, and means for adjustably extending or retracting said extension members.

3,908,850

BANDING AID

John Calvin Jureit, Coral Gables, and Andrew G. Seipos, Miami, both of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Filed Apr. 18, 1974, Ser. No. 461,923
Int. Cl.[2] B65D *9/34, 19/38;* **F16B** *15/00*
U.S. Cl. 217—70 **5 Claims**



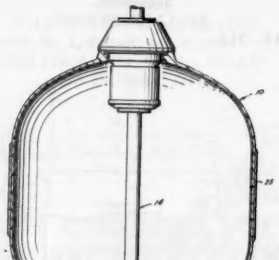
1. A bracket for use in banding containerized or palletized constructions comprising a sheet metal plate formed about an axis to define a pair of angularly related plate flanges for overlying similarly angularly related portions of the containerized or palletized construction, one of said flanges having at least a pair of teeth formed to project to one side of said one flange and adapted for embedment into a portion of the container on the same side of said one flange as the other flange projects therefrom, means defining a pair of shoulders spaced one from the other along said plate in the same general direction as said plate axis and defining a band receiving area of said plate therebetween whereby said shoulders are adapted to preclude shift of a band disposed about the containerized or palletized construction in overlying relation to said plate area between said shoulders in the general direction of the plate axis, said shoulder defining means comprising a pair of protrusions projecting outwardly from said plate, said teeth being struck to project to the side of said one flange remote from the other flange and leaving corresponding slots in said one flange, said teeth having angularly related shank and tip portions with the shank portion of each tooth projecting from said shank portion in a direction toward the corresponding slot whereby the tip portions are poised for insertion through their corresponding slots for embedment into a portion of the containerized or palletized construction.

3,908,851

FILAMENT WOUND VESSEL

Eugene F. Jacobs, Tulsa, Okla., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed July 31, 1974, Ser. No. 493,269
Int. Cl.[2] B65D *25/14*
U.S. Cl. 220—3 **10 Claims**



1. a filament wound, generally spherical bottle comprising, a liner having a neck extending outwardly and providing an opening into the liner,

a girth neck winding of filaments and resin about said neck providing an anchorage for securing equipment to the bottle,

the outer circumferential surface of said neck winding forming with the surface of the liner extending away from the neck winding an included obtuse angle,

an inner polar winding of filaments and resin over said liner and lying adjacent said neck winding,

and an outer polar winding of filaments and resin overlying said neck winding and preventing the neck winding from pulling away from the liner.

3,908,852

FOOD CONTAINER ASSEMBLY

Sam Ricobene, 250 W. 26th St., and Lyman D. Dunn, 325 W. 25th Pl., both of Chicago, Ill. 60616

Filed Sept. 11, 1972, Ser. No. 287,651
Int. Cl.[2] A45C *11/20;* **B65D** *1/24, 21/02*
U.S. Cl. 206—550 **2 Claims**

1. A container assembly comprising:

a bottom end panel having an inner face defining a support surface, and a plurality of bottom side walls extending upwardly from the inner face, each bottom side wall terminating in an upper edge defining an irregular offset portion, said bottom panel having a plurality of vent ports or apertures for air communication with the exterior;

at least one intermediate panel adapted to fit on top of the bottom end panel and having a generally horizontal web

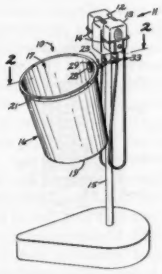
with a top surface defining a support surface, the web of said intermediate panel including a plurality of apertures for permitting the flow of gas and moisture through said intermediate panel, a plurality of intermediate side walls depending from said web and terminating in an offset lower edge complementary to said bottom end panel upper edge and adapted to matingly interengage with said bottom end panel upper edge, and a plurality of upstanding intermediate side walls terminating in an offset upper edge identical with said bottom side wall upper edge; and a top end panel identical to said bottom panel to fit on top of the intermediate panel and having an inner bottom face, and a plurality of side walls depending from the inner face and terminating in a downwardly facing lower edge identical to said depending intermediate side wall lower edge and adapted to matingly interengage with said upstanding intermediate side wall upper edge, each of said intermediate and bottom panels having on its lower surface and said top panel having on its upper surface a plurality of transverse intersecting channels defining a plurality of pads for supporting a food product with said channels forming conduits for air flow from the bottom panel vent ports through the container and exiting from said top panel vent ports to keep the foot product crisp.

3,908,853

TRASH COLLECTOR FOR DRIVE-IN THEATERS

Kenneth P. Keesling, Rt. 3, Albert Lea, Minn. 56007

Filed Nov. 15, 1973, Ser. No. 416,088
Int. Cl.² B65D *25/24*
U.S. Cl. 220—18 **4 Claims**



1. A trash collector movably attached to a speaker system having a vertical post disposed adjacent vehicle positions at drive-in theaters and the like, said trash collector comprising:

a. a generally vertical support post in combination with a receptacle, said receptacle including a tubular side wall having an open top, a bottom wall with a perforated bottom portion, and a join portion between said side and bottom walls, the bottom portion of said receptacle movably abutting said vertical post to partially support said receptacle with the tubular side wall generally inclined relative to the vertical post;

b. a mounting bracket for supporting said receptacle on the vertical post in close proximity thereto, said mounting bracket having a generally U-shaped configuration including spaced apart leg portions and a connecting portion extending between said leg portions, one of said leg portions skewed relative to the opposite leg portion such that said receptacle tubular side wall is inclined relative to the vertical post when said receptacle is attached thereto;

c. securing means pivotally securing one end of said mounting bracket to the side wall of said receptacle at a single location adjacent said open top thereof, said securing means including the side wall of said receptacle and one of said leg portions of said bracket having openings formed therein, a pivot pin extending through said openings and having an enlarged head disposed interiorly of said tubular side wall, and restraining means on said pivot pin between said leg portions, said securing means allowing said receptacle to be pivoted in two general directions relative to said mounting bracket; and

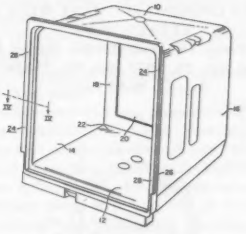
d. mounting means adapted to secure the other end of said mounting bracket to the vertical post by securing one leg of said mounting bracket to the vertical post with the leg portions extending upwardly from said connecting portion.

3,908,854

DISHWASHER TUB GASKET SURFACE

Olan L. Long, Columbus, Ohio, assignor to White-Westinghouse Corporation, Cleveland, Ohio

Division of Ser. No. 141,685, May 10, 1971, Pat. No. 3,732,835. This application Dec. 21, 1972, Ser. No. 317,329
Int. Cl.² B65D *7/42*
U.S. Cl. 220—74 **2 Claims**



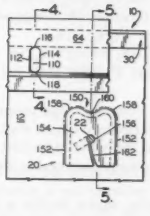
1. A metal dishwasher tub formed to include a plurality of walls and a forwardly open face defined by perimetric border portions including a seating surface for a gasket, said seating surface extending along at least some of the sides of said open face, said seating surface having a concave shape in transverse section, said concave shape being formed by restriking said seating surface to effect sufficient displacement of the material forming said seating surface to eliminate irregularities created in said seating surface during a tub-forming expanding process.

3,908,855

BAIL RECEIVER FOR PLASTIC CONTAINERS

Edgar R. Rowe, Cleveland, and Robert R. Terlop, Brookpark, both of Ohio, assignors to Van Dorn Company, Cleveland, Ohio

Division of Ser. No. 272,766, July 18, 1972, Pat. No. 3,831,798. This application May 17, 1974, Ser. No. 470,916
Int. Cl.² B65D *25/32*
U.S. Cl. 220—91 **4 Claims**



1. In a plastic container of the type having an open end, a closed bottom wall, a side wall extending upwardly from said bottom wall and including inner and outer surfaces, and at least one bail receiver on said outer surface, said bail receiver

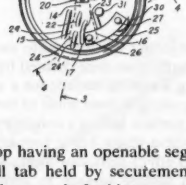
including a plate portion spaced outwardly from said outer surface and having a top edge, a bottom edge and side edges and a continuous wall interconnecting said top and side edges with said outer surface of said container side wall, said plate portion having an aperture therethrough spaced from said top edge to receive a bail end, and said aperture having an upper portion engaged by said bail end when said container is supported in suspension by the bail, the improvement comprising: said continuous wall being undulated between said side edges of said plate portion, a slot in said plate portion for guiding said bail end into said aperture, said slot having an entrance end in said bottom edge of said plate portion and a second end opening into said aperture at a location spaced from said upper portion thereof, said slot having opposed side edges spaced apart along the length thereof from said entrance end to said second end, and at least the portions of said side edges of said slot at said second end being spaced apart a distance less than the cross-sectional dimension of said bail end.

3,908,856

CONTAINER OPENING SEGMENT WITH SWIVEL ATTACHMENT

Walter Merton Perry, 76 Locust Hill Rd., Darien, Conn. 06820

Filed Apr. 26, 1973, Ser. No. 354,807
Int. Cl. B65d *41/32*
U.S. Cl. 220—269 **17 Claims**



1. A container top having an openable segment defined by a score line, a pull tab held by securement means to said segment for manual removal of said segment from said top to form an opening, and means for attachment of said segment to said top after opening comprising:

a. an arm member extending from said segment to said container top;

b. attachment means between said arm member and said segment with said attachment means positioned at a point spaced away from said pull tab securement means;

c. attachment means between said arm member and said container top on the upper side of said top to permit positioning of said segment away from said opening.

3,908,857

TAPE SEAL FOR CONTAINER

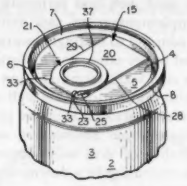
Wayne T. Chiappe, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,703
Int. Cl.² B65D *41/00*
U.S. Cl. 220—359 **10 Claims**

1. A closure for a container end member having a center panel portion and a peripheral chuck wall and a chuck-receiving annular groove in the panel adjacent the chuck wall and having pour opening means disposed in close proximity to said groove;

a tape of rectangular shape having a body portion and a finger-grip lift portion folded over the body portion and forming a fold edge at one end of the body portion and corners therewith at the lateral edges thereof;

means removably connecting said body portion to said center panel portion in a position disposing said folded edge proximate to said chuck wall chordally with respect to said groove and locating said corners in overlapping relation to the groove,



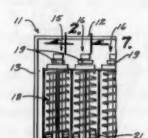
said corners being folded inwardly from said lateral edges to clear said groove.

3,908,858

PARTITIONING APPARATUS FOR VENDING MACHINE HELIX DISCHARGE UNITS

Arthur N. Wirstlin, Altoona, and David N. Forlenza, Des Moines, both of Iowa, assignors to Fawn Engineering Corporation, Des Moines, Iowa

Filed May 8, 1974, Ser. No. 468,187
Int. Cl.² G07F *11/00*
U.S. Cl. 221—75 **5 Claims**



1. In a vending machine having a cabinet and within one portion of which is an item discharge chute for dispensing items to be withdrawn from the machine, a plurality of item discharge units mounted in a side-by-side, horizontally disposed arrangement, each item discharge unit having a tray and a motor-driven helix member disposed therein, each item discharge unit further having a vertically disposed central divider plate extending within and along the length of the helix member, individual standard-sized items being held in pairs between consecutive convolutions of the helix member on opposite sides of the central divider plate and moved toward the discharge chute by rotation of the helix member, wherein the improvement comprises:

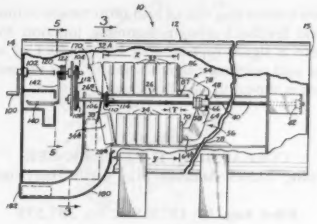
means for partitioning the spaces between the central divider plate and the walls of the tray so that the horizontal measure of the space is reduced whereby items of less than standard size in horizontal dimension are snugly accommodated;

wherein said means for partitioning includes a pair of divider spacer members affixed to opposite sides of the central divider plate, each of said divider spacer members having an upper extension portion and a vertical portion, said upper extension portion affixed at an inner end near the top of the central divider plate and the opposite outer end having the vertical portion affixed thereto and depending therefrom, whereby said vertical portion is held in spaced relation between the wall of the tray and the central divider plate.

3,908,859
ARTICLE DISPENSING APPARATUS

Robert C. Hohmann, Grants Pass, Oreg., assignor to S.J. Agnew, Agnew Environmental Products, Tenino, Wash.

Filed Jan. 31, 1974, Ser. No. 438,375
Int. Cl.[2] B65H 3/00
U.S. Cl. 221—118 11 Claims



1. Apparatus for dispensing articles having like dimensions as measured in one direction comprising

means defining a pair of elongate, laterally spaced, substantially parallel trays for supporting a plurality of such articles in adjacent rows, with the articles in each row contiguous and in line with each other with said like dimension of each article extending in a direction longitudinally of the tray, said trays being open at one set of their ends,

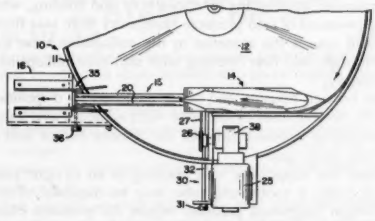
article shifting means comprising a pair of article shifting elements and means mounting said shifting elements for movement longitudinally of said trays, with one of said shifting elements positioned to engage and shift articles in one of said trays toward said open end of the tray and the other of said shifting elements positioned to engage and shift articles in the other of said trays toward the open end of the other tray on movement of said shifting elements toward said open set of ends of the trays, and

operating means operatively connected to said shifting means operable on actuation to shift said shifting elements simultaneously toward said set of ends of the trays a distance equal to one half said dimension of an article, with said elements being spaced different distances from the open ends of their associated trays, said difference in distances being substantially equal to a positive odd integer multiplied by one half of said dimension of an article.

3,908,860
FEEDER AND DRIVE TRACK

George E. Schultz, Clearwater, Fla., assignor to Tangen Drives, Inc., Clearwater, Fla.

Continuation-in-part of Ser. No. 254,888, May 19, 1972, abandoned. This application Apr. 11, 1973, Ser. No. 350,163
Int. Cl. B63q 7/12
U.S. Cl. 221—161 3 Claims



1. A feeder and driving track for parts comprising, in combination,

a rotary conical feeding member, its vertical axis extending upwardly,

a feeder wall surrounding said rotary conical feeding member, and extending thereabove,

means for driving said rotary conical member,

pickup plow means positioned tangentially on said rotary conical member for receiving individual parts driven circumferentially around said feeder by said rotary conical member for elevating the parts to a drop off end, and,

driven track feeding and delivery means including

a. counter-rotating driven rollers, and

b. means for driving said counter-rotating driven rollers, and,

c. means positioning said rollers above the rotary conical member more than half the distance from the vertical axis to the feeder wall and beneath the drop off ends of pickup plow means, and

said pickup plow being a waterfall type having a generally flat body portion,

said waterfall pickup terminating in a longitudinal edge approximately parallel to and above the spaced counter-rotating driven rollers,

a plurality of grooves in the periphery of said rotary conical driven member,

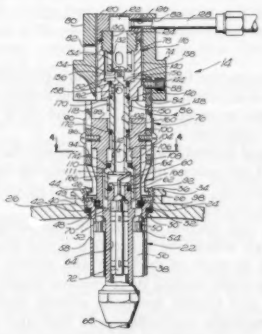
a plurality of fingers at the pickup portion of said waterfall cascade type plow,

the fingers and grooves being proportioned and oriented to position themselves in close proximate relationship, whereby said counter-rotating driven rollers will receive individual parts from said pickup assembly and deliver the same in floating fashion oriented between said rollers to a delivery point at the far end of the rotating driven rollers remote from said pickup assembly.

3,908,861
SERIES TAPPER ASSEMBLY AND METHOD

Mack S. Johnston, 1065 Lomita Blvd., No. 220, Harbor City, Calif. 90710

Continuation-in-part of Ser. No. 385,358, July 3, 1973, Pat. No. 3,836,053, which is a continuation-in-part of Ser. No. 189,281, Oct. 14, 1971, Pat. No. 3,758,008. This application Sept. 10, 1973, Ser. No. 395,898
Int. Cl.[2] B65D 83/00
U.S. Cl. 222—1 13 Claims



6. The method of tapping a plurality of beer kegs interconnected in series between a gas pressure source and fluid dispensing means, each keg having an opening in one wall thereof; a keg adapter in each opening and a tapper in operative engagement with each keg adapter; said tapper and keg adapter for each keg providing therethrough an inlet passageway for transferring fluid from outside the keg to inside the keg, and an outlet passageway for transferring fluid from inside to outside the keg, each of said passageways having an

inner end and an outer end; valve means in each inlet passageway yieldably biased toward the closed position to prevent fluid flow from inside to outside the keg; normally closed valve means in each outlet passageway movable to an open position; and actuating member carried by each tapper and movable between an open position and a closed position; means associated with each tapper and responsive to the movement of the actuating means from the closed to the open position to move the valve in the outlet passageway to the open position; conduit means interconnecting the gas pressure source with the outer end of the inlet passageway of the keg adjacent said source; conduit means interconnecting the fluid dispensing means with the outer end of the outlet passage of the keg adjacent said dispensing means; and conduit means interconnecting the outer end of the outlet passage of one keg with the outer end of the inlet passage of the keg adjacent thereto; including the steps of:

closing the fluid dispensing means;

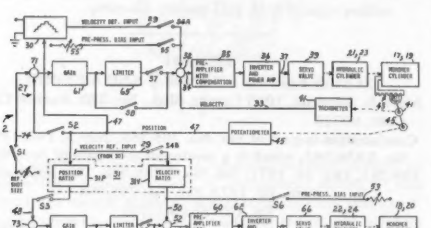
with the actuating member for each tapper in the closed position, moving each actuating member from the closed position to the open position, in sequence, starting with the keg adjacent to the fluid dispensing means.

3,908,862

RATIO CONTROLLED MIXING OF LIQUIDS

Rangasami Sarat Chandra, and Kirby Lee Stone, both of Cincinnati, Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Aug. 29, 1974, Ser. No. 501,743
Int. Cl.² B67D *5/08*
U.S. Cl. 222—63 **11 Claims**



1. Apparatus for feeding liquids in a preselected ratio from at least two separate sources and which have automatic control systems arranged in a master and slave relationship to effectuate said ratio comprising:

a. first and second positive displacement liquid feed means;

b. first and second means for measuring the rate at which, respectively, each of said first and second liquid feeding means dispenses its respective liquid;

c. first and second means for measuring the distance through which the respective liquid displacement elements in each of said first and second feeding means moves while feeding its respective liquid;

d. first and second feedback control system means, for automatically controlling said first and second feeding means, respectively, by feeding back signals from, respectively, said first and second rate measuring means to a summing junction in the respective control systems;

e. ratio control means for receiving a plurality of different input signals and in response thereto producing a plurality of output signals each having a preselected ratio to its corresponding said input signal;

f. reference signal means for providing to the summing junction of said first feedback system and to said ratio means input a signal representing a reference rate for said first feeding means to dispense its liquid;

g. a third summing junction for receiving signals from an output of said ratio means representative of the product of said ratio means times the output signal from said first distance measuring means and the feedback signal from said second distance measuring means and to feed forward the summed signal thereby produced to the summing junction of said second feedback control system; and

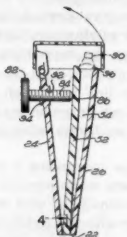
h. means connecting one of said ratio means outputs to said second feedback system summing junction to provide thereto a signal representing the product of said ratio times said reference signal whereby said second feeding means is slaved to said first feeding means.

3,908,863

COLLAPSIBLE TUBE DISPENSER

Dana White, 11595 Addison St., North Hollywood, Calif. 91601

Filed Aug. 10, 1973, Ser. No. 387,575
Int. Cl.² B65D *35/28*
U.S. Cl. 222—103 **1 Claim**



1. A dispenser for toothpaste and the like material packaged in a collapsible tube comprising:

a generally rigid, wedge-shaped housing defined by first and second side walls which flare apart from a bottom end of the housing to a top end of the housing, a first opening formed in said top end of the housing and a second opening formed in said first side wall;

a pressure plate;

means for pivotally mounting and supporting said pressure plate upright in said housing intermediate said side walls whereby to define a pivot for the bottom end of said pressure plate at the intersection of the planes of the confronting surfaces of said pressure plate and said second side wall, the top end of the plate being freely positionable in said housing;

means for adjustably positioning said pressure plate at a predetermined position intermediate said first and second side walls comprising a member axially movable in said second opening through said first side wall, one end of said member terminating in the interior of said housing and abutting said pressure plate, the other end of said member terminating exteriorally of said housing, wherein movement of said pressure plate away from said first side wall causes the material in the collapsible tube to exit through said first opening with said tube collapsing uniformly;

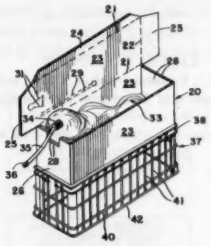
said bottom housing end being enclosed by disposition of the bottom ends of said side walls adjacent and latterally engaging opposite sides of the bottom end of said pressure plate; and

means for supporting said housing in an upright position whereby a toothpaste tube may be disposed in an upwright supported position within the pressure chamber formed by said pressure plate and said second side wall for selectively dispensing selected portions of the tube contents by actuation of said movable member.

3,908,864
CONTAINER FOR BULK LIQUIDS SUCH AS MILK

Max V. Capper, 39-25th Ave., Isle of Palms, S.C. 29451

Filed Sept. 28, 1970, Ser. No. 76,371
Int. Cl. B65d *35/56*
U.S. Cl. 222—105 3 Claims



1. A container for storing, transporting and dispensing beverages comprising an exterior substantially rigid rectangular case having one open side, said case being of a shape and size to fit conveniently inside of a refrigerated beverage dispensing cabinet and said case being readily portable, an intermediate stiff protective liner in the form of an initially flat foldable sheet material blank which is erectable by folding into a rectangular box-like form which is not self-supporting in the erected condition, the erected box-like liner being bodily insertable into said exterior rigid case in closely confined relationship therein so that the rigid case forms the means of maintaining said liner in the erected box-like form and prevents the liner from collapsing into its original flat form, said erected liner having a hinged closure portion at one side thereof, a thin-walled highly flexible bag for holding a beverage without leakage insertable bodily into the erected liner prior to closing the hinged closure portion, whereby said bag is fully enclosed and protected by the liner following the closing of said closure portion, a liquid filling and discharging tube extension on said bag, said erected liner and said case having alignable opening means through which said tube extension is extended to the exterior of the container during the use thereof for dispensing the beverage, said tube extension being retractable to lie entirely inside of the liner during usage of the container for storing and transporting the beverage, and a readily separable and removable closure panel for the open side of the exterior rigid case and spanning the erected liner therein and preventing dislodging of the liner from the case prematurely or collapsing of the liner to its flat form, the liner with an empty bag therein being readily removable from said open side of the case for disposal after a single usage with the liner returned to its flat form.

3,908,865
DUAL CYLINDER FEEDER FOR COURSE GRANULAR MATERIAL

Donald F. Day, 9213 Tamarind, Fontana, Calif. 92335

Filed Oct. 15, 1973, Ser. No. 406,568
Int. Cl.[2] B67D *5/52*; F04B *7/04*
U.S. Cl. 222—135 1 Claim

1. In an apparatus for feeding course granular material, for example crushed oil shale upward to a given region, the combination of:

a carriage movable along a path below said region between a first position of the carriage and a second position of the carriage;

a fixed outlet passage extending upward from said path to said region;

a first supply passage to supply said material, said first supply passage being located on said path on one side of said outlet passage and extending downward to said path;

a second supply passage to supply said material, said second supply passage being located on said path on the other side of said outlet passage and extending downward to said path;

a first cylinder on the carriage below said path and extending upward to the path;

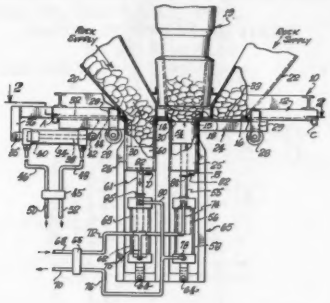
a first piston reciprocative in said first cylinder;

a second cylinder on the carriage of substantially the same outside diameter as the first cylinder and spaced from the first cylinder along said path, said second cylinder being below said path and extending upward to the path;

a second piston reciprocative in said second cylinder;

a first gate on the carriage extending along said path in one direction away from the two cylinders;

a second gate on the carriage extending along said path in the opposite direction away from the two cylinders,



the outlet passage and the two supply passages being so located along the path and the two cylinders and the two gates being so located on the carriage that at the first position of the carriage the second cylinder registers with the outlet passage, the first cylinder registers with the first supply passage to receive material gravitationally therefrom, and one of the two gates closes the second supply passage and at the second position of the carriage the first cylinder registers with the outlet passage, the second cylinder registers with the second supply passage to receive material gravitationally therefrom, and the other of the two gates closes the first supply passage;

a first double-acting fluid-actuated power cylinder to shift the carriage to its two opposite positions alternately;

a first four-way valve to control the first double-acting fluid-actuated power cylinder;

two double-acting fluid-actuated power cylinders to operate the two pistons respectively;

a second four-way valve connected oppositely to said two double-acting fluid-actuated power cylinders to control both of the two power cylinders, whereby the opposite movements of the two pistons are initiated simultaneously, but the greater load on the upwardly moving piston causes completion of the upward movement of the piston to lag behind the completion of the downward movement of the other piston;

a first normally open terminal switch to close in response to completion of the upward movement of one of the two pistons to operate the first four-way valve in one of its two respects to shift the carriage to one of its two positions;

a second normally open terminal switch to close in response to arrival of the carriage at said one of its two positions to operate the second four-way valve in one of its two opposite respects;

a third normally open terminal switch responsive to completion of the upward movement of the other of the two pistons to operate the first four-way valve in its opposite respect to shift the carriage to the other of its two positions; and

a fourth normally open terminal switch responsive to arrival

of the carriage at said other of its two positions to operate the second four-way valve in its opposite respect.

3,908,866

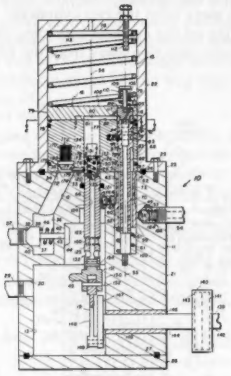
FLUIDS MIXING AND PROPORTIONING DEVICE

Merritt J. Brown, 813 Hastings Dr., Kissimmee, Fla. 32741

Filed Feb. 4, 1974, Ser. No. 439,580

Int. Cl.[2] B67D *5/40*

U.S. Cl. 222—135 **7 Claims**



7. A fluids proportioning and dispensing device comprising a piston chamber having opposite ends, a fluid inlet passageway communicating with the chamber at one of said ends for admitting a first fluid to said chamber, a fluid discharge passageway communicating with the chamber at said one end for discharging a mixture of said first fluid and a second fluid, a piston linearly movable in the chamber, elongated means linearly movable relative to said piston for pumping said second fluid into the chamber, and means for reciprocatingly driving said piston in said chamber including means for establishing a fluid drive coupling between said elongated means and said piston.

3,908,867

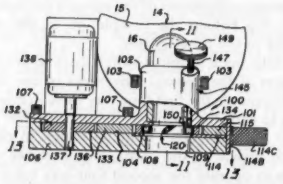
APPARATUS FOR FLAVORING SOFT ICE CREAM BEING DISPENSED FROM A MACHINE

Edward D. Raitt, 5525 Blenheim St., Vancouver 14, British Columbia, Canada

Filed June 3, 1974, Ser. No. 475,870

Int. Cl.[2] B67D *5/56*

U.S. Cl. 222—145 **6 Claims**



1. Apparatus for flavoring soft ice cream or the like moving as a stream through a delivery spout of a dispensing machine, comprising a flavoring wafer attachable to the delivery spout and having spaced carriers supported in the path of the ice cream stream, and a flavoring material contained by the spaced carriers adapted to be picked up by and dispensed through the steam, said spaced carriers being flexible tubes having closed ends and longitudinally spaced outlets, said flavoring material being a fluid placed within the flexible tubes prior to the closing of the closed ends thereof and being extruded through the spaced outlets as said tubes are flexed by the ice cream stream.

3,908,868

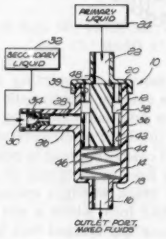
LIQUID DISPENSER

Alfred J. Peirish, Jr., Fountain Valley, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 31, 1974, Ser. No. 474,948

Int. Cl.[2] B67D *5/56*

U.S. Cl. 222—145 **14 Claims**



1. A liquid dispenser comprising:

a housing having a primary chamber therein and inlet and outlet ports communicating with said primary chamber, said inlet port opening into the upper end of said primary chamber and being adapted to be connected to a source of primary liquid above said chamber, said outlet port opening into the lower end of said primary chamber;

means on said housing defining a secondary liquid chamber opening into said primary chamber, and means including an inlet passage adapted to be connected to a source of secondary liquid;

plunger means slidable vertically in said primary chamber between upper and lower positions, said plunger means having passage means therethrough extending between said inlet and outlet ports, in said upper position said plunger means closing said inlet port and said secondary liquid chamber and in said lower position said passage means being in direct flow communication with said inlet port and said secondary liquid chamber so that liquids entering said primary chamber from said inlet port and said secondary liquid chamber will mix within said passage means and thereafter discharge from said primary chamber through said outlet port, said plunger means being movable downwardly from said upper position to said lower position soley by the introduction of fluid pressure through said inlet port into said primary chamber; and

means biasing said plunger means toward said upper position.

3,908,869

METHOD AND APPARATUS FOR DISPENSING AIR-CURABLE VISCOUS MATERIALS

Ward Arthur Little, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

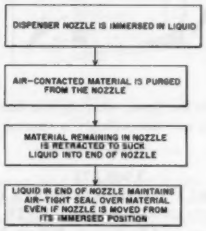
Filed Jan. 22, 1974, Ser. No. 435,621

Int. Cl.[2] B67D *1/08*

U.S. Cl. 222—148 **5 Claims**

1. A dispenser comprising a dispensing nozzle, a conduit operably connected to said nozzle to supply air-curable material to it, pressure means operably connected to force said

material through the conduit means and out of the nozzle, in combination with a liquid reservoir at least partially filled with a liquid, said nozzle and reservoir being mounted for relative movement so the nozzle can be immersed in said liquid, whereby the liquid is caused to form an air seal around the dispensing end of said nozzle when the nozzle is immersed in the liquid, and drive means for causing said relative movement following a dispensing operation of the nozzle, thereby to prevent the nozzle from being clogged by air-curing of the material supplied to it through said conduit means, said drive


DISPENSER NOZZLE IS IMMERSED IN LIQUID
AIR-CONTACTED MATERIAL IS PURGED FROM THE NOZZLE
MATERIAL REMAINING IN NOZZLE IS RETRACTED TO SUCK LIQUID INTO END OF NOZZLE
LIQUID IN END OF NOZZLE MAINTAINS AIR-TIGHT SEAL OVER MATERIAL EVEN IF NOZZLE IS MOVED FROM ITS IMMERSED POSITION

means being operable to move said nozzle in a horizontal plane to form a variety of pre-selected patterns to enable the material dispensed from the nozzle to be deposited on a surface beneath the nozzle in said patterns and to position the nozzle over the reservoir, and said drive means being further operable to move the nozzle in a generally vertical direction to and from a position in which said dispensing end is immersed in said liquid, said pressure means being selectively operable to discharge material from said nozzle after the end thereof is immersed in said liquid thereby to purge from the nozzle all of the material in it that has been exposed to air.

3,908,870

MANUAL-TYPE MINIATURE ATOMIZER

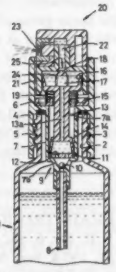
Takamitsu Nozawa, and Takao Kishi, both of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1974, Ser. No. 523,421

Claims priority, application Japan, Nov. 15, 1973, 48-131929; Dec. 25, 1973, 49-2426; Mar. 29, 1974, 49-35748; May 1, 1974, 49-49650

Int. Cl.² B67D *5/42*

U.S. Cl. 222—321 **12 Claims**



1. A liquid spraying device comprising a container for liquid, including an axially perforated cap, spray means including a nozzle associated with said container and including reciprocable means extending through said cap, first pressure chamber means depending beneath said cap, second pressure chamber means in axial alignment with said first pressure chamber means and positioned above said cap, said reciprocable means including plural piston members arranged for cooperation with said axially aligned pressure chambers and further including first valve means, said valve means being arranged to control liquid flow from said second pressure chamber to the nozzle of said spray means, spring means arranged to maintain said first valve means in a closed condition to prevent inadvertent emission of liquid therefrom, second valve means in said first pressure chamber means, liquid carrying means depending from said last-named means and extending into said container, whereby upon reciprocation of said spray means said liquid is transported from the container through the axially aligned first and second pressure chambers and emitted from said nozzle.

3,908,871

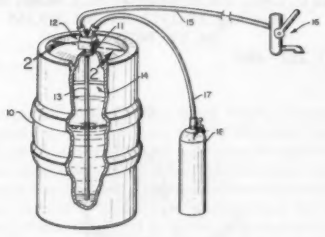
KEG CLOSURE AND COUPLER ASSEMBLY

Antonin Gottwald, Ventura, Calif., assignor to Double Check Industries, Inc., Oxnard, Calif.

Filed Oct. 15, 1974, Ser. No. 514,499

Int. Cl.² B65D *83/00*

U.S. Cl. 222—400.7 **13 Claims**



1. A keg closure and coupler assembly for connecting the interior of a keg with a liquid dispensing line and source of compressed gas, comprising, in combination:

a. a keg connector body having first and second passages;

b. a dispensing line connector body having first and second passages; and,

c. lower and upper separable plates having registering bores disposed between said keg connector body and dispensing line body, relative movement between the plates and the bodies in one direction positioning one of said registering bores in communication with each of said first passages and also positioning the other of said registering bores in communication with each of said second passages, relative movement in an opposite direction positioning the registering bores respectively out of registration with each of the first and second passages to close off communication therebetween.

3,908,872

HANDLE ACTUATED DISPENSING DEVICE

John F. Cox, Sr., 4231 River St., Willoughby, Ohio 44094; Edgar F. Nelboeck, 6605 Ridgeburg Blvd., Mayfield Heights, Ohio 44124, and Robert E. Uline, 13906 Leroy Ave., Cleveland, Ohio 44135

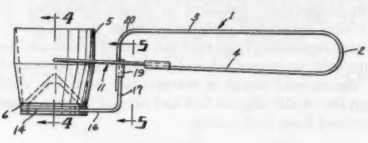
Filed Nov. 16, 1973, Ser. No. 416,618

Int. Cl. A47q *19/14*

U.S. Cl. 222—469 **1 Claim**

1. In a dispensing device for bottom discharge in combination, a tubular body member open at both ends, a conical closure part with the apex extending into the member and the lower extremity outside said member, said part comprising means to close said body at one end whereby material may be supported therein, and means to move said part into and out of engagement with the body comprising a handle unit having shiftable elements forming a generally U-shaped unit with a resilient connection between the elements thereof, said elements being normally substantially parallel, the extremity of

one element being pivotally connected to the other member, and the extremity of the element engaged to the part externally of the member, said elements being resiliently interconnected to normally urge the member and part into closing relationship and arranged such that pressure exerted on said elements will separate the part and member to allow discharge of material from said member.



3,908,873

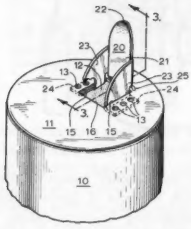
DISPENSER FOR GRANULAR MATERIAL

Richard C. Lewis, 175 E. Delaware Pl., Chicago, Ill. 60611

Filed Aug. 17, 1973, Ser. No. 389,165

Int. Cl.² B67D *3/00*

U.S. Cl. 222—480 **3 Claims**



1. A dispenser for pouring or sifting granular material comprising:

a container having a surface provided with a pouring aperture and a plurality of sifting apertures disposed in said surface in spaced relationship to said pouring aperture;

a spout, having a front piece, pivotably secured to said surface adapted, when in a first position of pivotal adjustment, to overlie and seal off said pouring aperture;

sidewalls extending from said front piece; and flange means secured to at least one of said sidewalls inside said container adapted to engage and seal off said sifting apertures when said front piece is in a second position of pivotal adjustment, said pouring aperture being unsealed when said front piece is in said second position and said sifting apertures being unsealed when said front piece is in said first position.

3,908,874

HOSIERY MANUFACTURE

Bob Haselgrove, and John Derek Nichol, both of High Wycombe, England, assignors to Detexomat Machinery Limited, High Wycombe, England

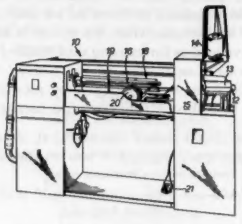
Filed Jan. 30, 1975, Ser. No. 545,386

Claims priority, application United Kingdom, Feb. 9, 1974, 6003/74

Int. Cl.² A41H *43/00*

U.S. Cl. 223—43 **22 Claims**

1. Everting apparatus for hose-making plant, comprising a suction tube, roller means for drawing hose welt-first onto said tube to dispose a toe portion of the hose in engagement with the end of said tube, said roller means thereupon being operable to exert and maintain a presettable tension on the hose with the toe end thereof in engagement as aforesaid, and means for applying suction to said tube and for relieving said tension exerted on the hose, whereby the hose is sucked toe-first into said tube and accordingly is caused to be everted.



3,908,875

EXTENSIBLE BELT WITH EXTENSIBLE CONNECTION TO SMALL IMPLEMENTS

Woodrow F. Wilson, and Frances Y. Wilson, both of W. River Rd., R.F.D. 5, Oswego, N.Y. 13126

Filed May 15, 1974, Ser. No. 470,217

Int. Cl.² A45C *1/04*

U.S. Cl. 224—5 A **2 Claims**

1. A belt and implement lanyard combination comprising a belt of coiled plastic, means for attaching the two ends of the belt together around a human torso, an attachment to the belt of a coiled lanyard of the same general form as the belt which can be extended and which carries at one end an attachment for light implements and at the other end an integral plastic ring through which the plastic of the belt passes, whereby when the belt is somewhat stretched the ring can slide along the plastic to any desired position and the belt then allowed to recoil and thus keep the lanyard and the implements attached to the belt at a particular point desired.

3,908,876

CAR TOP DRAIN TROUGH CLAMP

Alphonso F. Barhorst, R.R. No. 6, Sidney, Ohio 45365

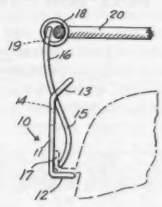
Filed Jan. 22, 1974, Ser. No. 435,502

Int. Cl.² B60R *9/04*

U.S. Cl. 224—42.1 B **1 Claim**

1. A tie down car top drain trough clamp comprising a generally L-shaped upright jaw member including a horizontal flange extending perpendicularly from the lower edge of said member and an inwardly offset upper end portion overlying said flange, a generally rectangular opening formed in said member and terminating in said portion, a second jaw member including a tongue extending integrally upwardly from said second jaw member and freely, slidably extending through the opening in said L-shaped jaw member, with the lower end of

said second jaw member positioned in opposition to the lower end of said L-shaped jaw member, said second jaw member and said tongue together being generally S-shaped in side elevation, said tongue adapted to pivot in said opening to clamp said second jaw member and said L-shaped jaw member into tight engagement with a car top drain trough positioned therebetween, and an aperture in the upper end of said tongue for securing a tie down rope to said tongue member whereby upon tension on said tie down rope in the same direction that the horizontal flange extends from the lower edge of said L-shaped member, the jaw members will tightly clamp the car top drain trough therebetween.

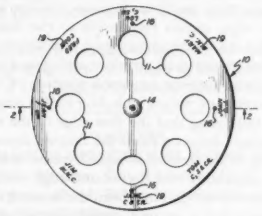


3,908,877

HOLDER AND SERVER FOR BEVERAGE CUPS AND THE LIKE

Daniel F. Kosisky, 3365 Wye Mills South, Laurel, Md. 20810

Filed Feb. 12, 1974, Ser. No. 441,908
Int. Cl.[2] A47G *23/06*
U.S. Cl. 224—48 A **1 Claim**



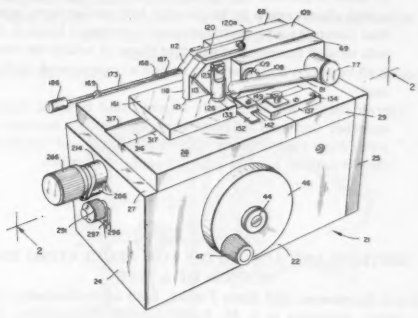
1. A holder and server for beverage cups and the like comprising a circular plate body portion having a plurality of circumferentially equidistantly spaced cup-receiving openings formed therethrough, said openings being centered on a circle concentric with the center of the plate body portion and spaced radially inwardly from the circular margin of the plate body portion, at least the top surface of the plate body portion formed to provide an easily erasurable writing-receiving surface adjacent each cup-receiving opening, whereby beverages of individuals being served may be readily changeably identified on said top surface, said plate body portion being formed of velvetized plastic and said top surface being textured to produce said erasurable writing-receiving surface, a single upstanding handle for the holder and server fixed to the circular plate body portion at the center thereof and spaced equidistantly from said openings, and a plurality of circumferentially equidistantly spaced support legs of equal length dependingly fixedly secured to the bottom of the plate body portion and lying on a circle concentric with the circle on which the openings are centered and radially outwardly thereof and between the openings and the margin of the plate body portion.

3,908,878

APPARATUS FOR PRODUCING GLASS KNIVES FOR MICROTOMES AND THE LIKE

Josef Blum, Norwalk, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 8, 1973, Ser. No. 413,960
Int. Cl. B26f *3/00*
U.S. Cl. 225—96.5 **18 Claims**



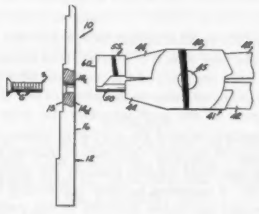
1. Apparatus for cutting a glass block which comprises: a frame; a platform on said frame; spaced elongated parallel support means on said platform for supporting the glass block, said support means defining a recess therebetween; an elongated pressure bar disposed above and intermediate said support means, parallel to said recess, said pressure bar being movably mounted with respect to said support means to apply a linearly arrayed force to the top surface of the glass block, said support means being spaced apart by a distance greater than the width of said pressure bar; and means in said frame producing a score mark on the bottom of said glass block intermediate said support means and directly beneath said pressure bar.

3,908,879

TUBING BREAK-OFF TOOL

John O. King, Jr., 3990 N. Ivy Road, Atlanta, Ga. 30301

Division of Ser. No. 274,613, July 24, 1972, Pat. No. 3,803,895, which is a continuation-in-part of Ser. No. 882,126, Dec. 4, 1969, Pat. No. 3,679,109, which is a continuation-in-art of Ser. No. 711,368, March 7, 1968, abandoned. This application Apr. 5, 1974, Ser. No. 458,217
Int. Cl.[2] B26F *3/00*
U.S. Cl. 225—103 **16 Claims**



1. Apparatus for adjusting the length of thin walled tubular sleeves including:

an internal support member slidably receivable into the tubular sleeve from one end thereof having an external configuration conforming to the internal configuration of the sleeve to internally support the sleeve about the circumference thereof and a projecting end selectively

aligned with that plane at which the sleeve is to be severed:

an external support member including a body and a clamping flange projecting from said body toward said internal support member, said flange defining a semi-circular concave gripping surface facing said internal support member and conforming to at least a portion of the external configuration of the sleeve for externally supporting at least a portion of the sleeve adjacent that plane at which the sleeve is to be severed and on the same side of that plane as said internal support member is located, that side of said flange opposite that plane at which the sleeve is to be severed undercut to define a countersunk surface; and,

carrier means for selectively moving said internal support member and said external support member toward and away from each other to alternatively grip and release the sleeve carried by said internal support member.

3,908,880

METHOD AND APPARATUS FOR REGULATING THE MOTION OF A WEB

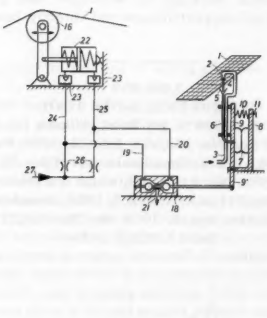
Gerd Russmann, and Hans Fauser, both of Heidenheim, Germany, assignors to J. M. Voith, GmbH, Heidenheim, Germany

Filed Sept. 4, 1974, Ser. No. 503,074

Claims priority, application Germany, Sept. 18, 1973, 2345821

Int. Cl.[2] B65H *25/26*

U.S. Cl. 226—3 **16 Claims**



1. Apparatus for regulating the movement of a web, such as a paper machine wire which comprises first means for supplying a fluid jet from one side of the plane of the web in a direction generally perpendicular to the plane of the web and at the edge of the path of the web whereby the edge of the web intercepts a portion of said jet, a second means on the other side of the plane of the web disposed to intersect the remaining portion of said fluid jet and convert the energy thereof to a static pressure, a common support supporting said first and second means and moveable laterally to the path of the web, resilient means biasing said support in one direction of movement thereof, fluid operable means connected to said support for movement of the support in the opposite direction of movement thereof and connected to receive said static pressure from said second means, guide means engaging said web and adjustable for controlling the path of the web, and control means for actuating said guide means in conformity with one of the movement of said support and the variations in static pressure at said receiver.

3,908,881

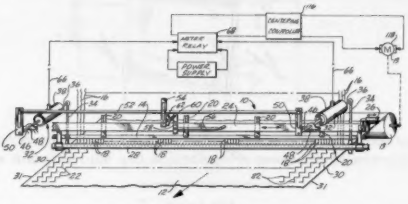
CENTERING SENSOR AND CONTROLLER

Gary D. McCann, 2455 E. Chevy Chase Dr., Glendale, Calif. 91206

Continuation-in-part of Ser. No. 343,011, March 21, 1973, Pat. No. 3,806,013. This application Mar. 14, 1974, Ser. No. 451,221

Int. Cl.[2] B65H *25/26*

U.S. Cl. 226—19 **24 Claims**



1. In a machine for operating on work having a desired centered position in the machine, the work being fed along a longitudinal path and being in contact with positioning means for adjusting the lateral position of the work relative to the desired centered position, the work being defined by spaced apart first and second longitudinal edges, apparatus for controlling the centering of the work in the machine independently of the width of the work or any lateral movement of the desired centered position of the work as it travels through the machine, the apparatus comprising first and second sensing means to sense the corresponding positions of the first and second longitudinal edges of the work; means coupled with the first sensing means to produce a first output representing the instantaneous position of the first longitudinal edge; means coupled with the second sensing means to produce a second output representing the instantaneous position of the second longitudinal edge; means responsive to the first and second outputs for producing an error signal indicating a deviation of the work from its centered position; and closed loop feedback means for controlling the centered position of the work, the closed loop feedback means including means responsive to the error signal indicating that the first edge of the work deviates a predetermined distance from the desired centered position for producing a first correction signal, means responsive to the error signal indicating that the second edge of the work deviates a predetermined distance from the desired centered position for producing a second correction signal, and means responsive to either the first or second correction signal for adjusting the work positioning means to automatically move the work back toward its desired centered position, the first or second correction signal being periodically produced by a corrective timer responsive to the presence of an existing error signal to move the work positioning means for a selected time period in a direction which moves the work back toward its centered position.

3,908,882

ELECTROMAGNETICALLY CONTROLLED FILM TRANSPORT DEVICE

Shigeo Wakahara, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 13, 1974, Ser. No. 496,987

Claims priority, application Japan, Aug. 18, 1973, 48-92098; Aug. 24, 1973, 48-94273; Aug. 24, 1973, 48-94274

Int. Cl.[2] G03B *1/22*

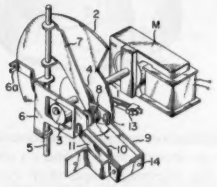
U.S. Cl. 226—67 **7 Claims**

1. An electromagnetically controlled film transport device comprising:

1. a film transport member having at one end thereof a claw portion engageable with a film perforation, said film transport member being reciprocally movable in a film

transport direction to transport a film and movable between a position in which said claw portion is engaged with a film perforation and a position in which said claw portion is retracted from the film perforation, said film transport member being biased to said latter position by a resilient member;

2. a pivotable member adapted to assume a first position in the direction in which said transport member transports the film and to assume a second position in the direction opposite to said film transport direction;
3. an electromagnet having a field member provided on one of said transport member and said pivotable member for attracting an attractable piece provided on the other of said two members, said electromagnet, when energized, uniting said two members together by its attraction to



transmit the movement of said pivotable member to said transport member so as to cause said transport member to be moved into and out of engagement with the film perforation, said transport member being in engagement with the perforation when said pivotable member is in its first position as long as said transport pivotable members are united together by the attraction of said electromagnet, said transport member being retracted from the perforation when said pivotable member is in its second position;

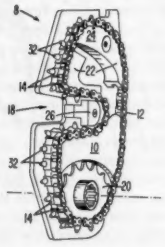
4. switching means for connecting said electromagnet to an electrical power source to energize said electromagnet; and
5. a phase switch parallel-connected to said switching means and adapted to be closed as long as said transport member is in engagement with the perforation.

3,908,883

ONE-CHAIN BI-DIRECTIONAL PAPER MOVER

Giorgio Bellisai, Nivelles; Guy Lemaire, Ittre, and Claude Gerard, Erpent, all of Belgium, assignors to Burroughs Corporation, Detroit, Mich.

Filed July 24, 1974, Ser. No. 488,649
Int. Cl.² R65H *17/38*
U.S. Cl. 226—74 **7 Claims**



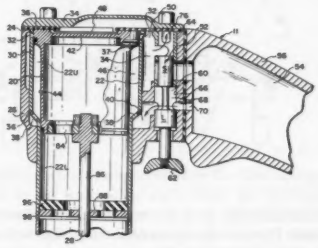
1. In a one-chain paper mover, an endless chain having means for engaging a paper web or document to be fed past an operating region, a first guide section and a second guide section spaced from each other and positioned within said endless chain and about which said endless chain is slidingly guided, and a third guide section positioned in the operating region and outside said endless chain and between said first and second guide section, said third guide section guidingly deflecting a portion of said chain inwardly in the operating region.

3,908,884

NAIL AND POWERED NAILER

John R. Schrepferman, Merriam, Kans., assignor to Bliss & Laughlin Ind., Inc., Oak Brook, Ill.

Division of Ser. No. 352,243, April 18, 1973. This application Oct. 11, 1974, Ser. No. 514,328
Int. Cl.² B25C *1/04*
U.S. Cl. 227—130 **5 Claims**



3. A power nailer comprising,

a housing having a hollow handle defining a compressed fluid reservoir,

a cylindrical sleeve secured within the housing having an enlarged upper portion at one end defining a power piston cylinder, and a lower reduced cylindrical portion therebelow,

a piston reciprocable in said lower cylindrical portion and having an enlarged head portion reciprocable in said upper portion,

said power piston cylinder having ports proximate the upper end and ports around the lower end of said enlarged portion,

said housing and sleeve defining a first passageway in communication with said upper ports and a second passageway in communication with said lower ports,

a head closing the upper open end of said cylindrical sleeve and having a third passage therethrough in communication with said first passageway,

said housing having a bore between said passages and said reservoir,

valve means in said bore movable between two positions in one of which the first and third passageways are connected to the reservoir and the second passageway is vented to atmosphere and in the other one of which the first and third passages are vented to atmosphere and the second passage is connected to the reservoir,

said piston head portion closing said upper ports in its resting position.

3,908,885

ROOF TRUSS FABRICATION APPARATUS

Robert I. Scott, 1728 Wayne St., Pomona, Calif. 91767

Filed June 12, 1974, Ser. No. 478,465
Int. Cl.² B25C *7/00*
U.S. Cl. 227—152 **9 Claims**

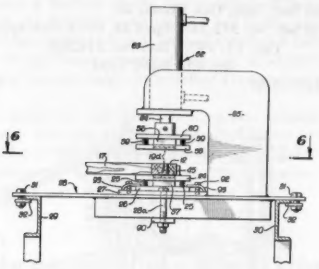
1. Apparatus for fabricating a roof truss that includes top and bottom chord members, web members and barbed connector plates, comprising

a. support means for receiving and locating the chord and web members in truss configuration, the web members located between the chord members,

b. clamping means for relatively clamping the chord members toward one another and toward the web members,

and structure to restrain the web members to receive clamping force transmitted to end portions thereof by the chord members, and

c. urging means to relatively urge the plates toward the clamped and restrained chord and web members thereby



to advance the plate barbs into said members at opposite sides thereof for interconnecting the web and chord members at said joints,

d. said support means including first yieldable platens located proximate said joints to be bodily displaced normal to the plane of the truss during said plate urging step.

3,908,886

APPARATUS FOR ULTRASONIC WELDING

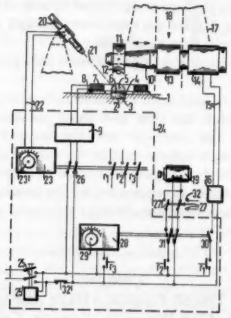
Hans Raske, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 27, 1974, Ser. No. 446,161

Claims priority, application Germany, Mar. 14, 1973, 2312724

Int. Cl.² B23K *1/06*

U.S. Cl. 228—1 **6 Claims**



1. An apparatus for ultrasonic welding comprising a sonotrode, an insert at right angles to the direction of oscillation of said sonotrode, a workpiece holder arranged to receive a non-metallic component, generating means for producing a high frequency electromagnetic field surrounding said component, said insert being positioned to provide ultrasonic oscillations parallel to the surface of a component received in said workpiece holder.

3,908,887

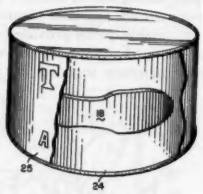
UTENSIL

Frank Leto, Northridge, Calif., assignor to Western Technical Products Co., North Hollywood, Calif.

Continuation of Ser. No. 131,164, April 5, 1971, abandoned. This application Feb. 12, 1973, Ser. No. 331,700

Int. Cl. B65d *3/00*

U.S. Cl. 229—1.5 C **4 Claims**



1. The combination comprising a container having an outer surface with an arcuate section and an elongated strip being attached to the container, said strip comprising a flexible resilient material having two stable states each of which conforms the strip to the arcuate section of the outer surface of the container, wherein one of said states is characterized in that the strip is resiliently bowed along its lateral axis and rigid along its longitudinal axis, wherein the other of said states is characterized in that the strip is resiliently coiled along its longitudinal axis and rigid along its lateral axis, said strip being capable of retaining said states independently of any external force, and wherein said strip defines a utensil when in said first state with a first longitudinal end of the strip serving as a handle and the second longitudinal end of the strip serving as a working end.

3,908,888

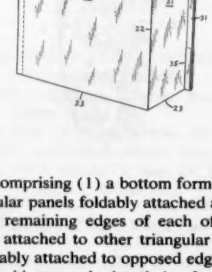
SINGLE PIECE CARTON WITH SLOPED BOTTOM AND EXTERIOR SEALS

Robert Louis Gordon, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,368

Int. Cl.² B65D *5/08, 33/16*

U.S. Cl. 229—16 A **47 Claims**



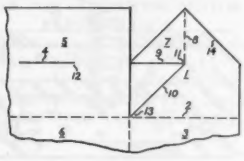
1. A carton comprising (1) a bottom forming panel having a pair of triangular panels foldably attached along a common edge, with the remaining edges of each of said triangular panels foldably attached to other triangular panels, and (2) wall panels foldably attached to opposed edges of the bottom forming panel, said opposed edges being formed solely from said other triangular panels.

3,908,889

CORNER LOCK FOR PAPERBOARD CONTAINERS

Paul Vjecsner, 350 W. 51 St., New York, N.Y. 10019

Continuation-in-part of Ser. No. 154,286, June 18, 1971, abandoned. This application May 23, 1973, Ser. No. 363,096
Int. Cl.[2] B65D 5/30
U.S. Cl. 229—35 3 Claims



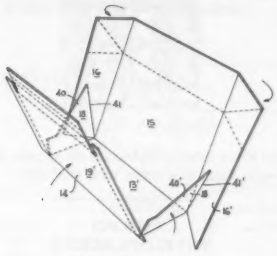
1. In a container structure of cardboard or similar material, said structure comprising an integral floor panel and a plurality of wall panels, with at least a pair of said wall panels being disposable substantially normal to said floor panel and to each other to form a corner for each container, said wall panels each having a side edge and a bottom edge, said bottom edges being adjacent said floor panel periphery, the improvement comprising an integral locking means for locking said disposed pair of wall panels to each other to form said corner, one of said pair of wall panels having a substantially horizontal slit extending therethrough, said slit having an end adjacent said corner, said other wall panel of said pair having a flap extending from said side edge of said other wall panel, said flap having a portion only being insertable in an entry position thereof into said wall panel slit into a locking position therein for locking said disposed pair of wall panels to each other to form said corner and having a pivot-axis in substantial coincidence with said slit when in said locking position, said flap portion thereof extending substantially downward after being inserted in said slit and having a base and a locking edge substantially facing the base of said flap, said locking edge substantially facing said corner in said locking position and extending at one end to one extremity of said pivot-axis and forming at said locking edge one end an acute angle with a straight line drawn from said locking edge one end to the juncture of the bottom edges of said pair of wall panels, said flap having an outer edge portion spaced from said locking edge at one extremity and substantially intersecting said locking edge to form a point at another extremity, said point being initially insertable through said slit during said flap insertion, said lock edge one end substantially abutting said slit end when in said locking position, said flap being bendable about said pivot-axis in a direction toward said slit for deflecting said locking edge from said acute angle toward at least substantially a right angle with respect to said straight line to widen said acute angle in the direction toward said slit for providing said entry position and in an opposite direction to substantially reform said acute angle from said widened angle for providing said locking position substantially after completion of insertion of said flap through said slit, said pivot-axis being at an angle of less than 180° with respect to said straight line on the side of said locking edge to cause said acute angle widening for enabling provision of said entry position and for enabling provision of said locking position upon said acute angle substantial reformation, said flap only being removable after said completion of insertion upon a reforming of said widened angle, whereby said completion of said insertion of said flap through said slit locks said flap in said locking position for forming said corner from said locked wall panel pair.

3,908,890

HEAT SEALABLE CARTON AND METHOD OF FORMING SAME

Thomas R. Baker, Los Altos, Calif., assignor to Kliklok Corporation, Greenwich, Conn.

Filed Apr. 14, 1972, Ser. No. 244,119
Int. Cl. B65d 5/02, 5/22
U.S. Cl. 229—37 R 13 Claims



1. A foldable carton of paperboard or the like having overlying panels to be bonded to each other by thermoplastic adhesive material on at least one of each pair of the surfaces to be bonded comprising a bottom panel, a pair of major side panels articulated to opposite sides of said bottom panel, major end flaps articulated to the other two sides of said bottom panel, major end panels articulated to two upstanding edges of one of said side panels, the width of said end panels and said end flaps being substantially the same as said bottom panel for full overlap, minor end panel strips articulated to the upstanding edges of the other side panel to overlie the free edge of said major end panels, said end flaps having a thermoplastic adhesive material strip across the full width thereof adjacent said bottom panel for bonding to said major end panel, and said end flaps each including a guide tab above said strip only on the side adjacent said major end panel for extended engagement with said end panel for guiding the same during folding, said carton being formed of blanks cut from flat stock, adjacent blanks being oppositely directed with the major end panel of one beiing contiguous with the minor end panel strip of the other, said end flap including said guide tab of one blank being formed in the stock contiguous to said end flap including said guide tab of the of the other blank, and the adjacent guide tabs on the flat stock being defined by a diagonal bisecting line, whereby said tabs are triangular to give maximum resistance to bending during folding and simplicity of blank cutting and whereby a full sealed bottom is assured while paperboard is conserved.

3,908,891

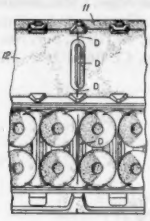
DIVISIBLE THERMOPLASTIC EGG CARTON

William B. Jackson, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 236,620, March 21, 1972, abandoned. This application Mar. 14, 1974, Ser. No. 450,970
Int. Cl.[2] B65D 1/26, 17/24
U.S. Cl. 229—51 DB 3 Claims

1. An egg carton structure formed from polystyrene foam comprising a cover section and a bottom cellular section hinged to said cover section, said cover section having a concavity in the central portion of the top wall of said cover section, said concavity being continuously slit along its bottom edge, and said concavity, when said carton is closed, cooperating with and bearing against a centrally located transverse egg separating member located in said bottom cellular section, said transverse member being slit along its upper edge and said cover section being further characterized by having slit means separated by unweakened areas of said foam, said slit means being in substantially longitudinal alignment with said transverse separating member when said carton is in an open posi-

tion whereby when said carton is fractured by applying manual pressure on opposite ends of said carton said unweakened



areas of said foam intermediate said slit means fracture along a line in longitudinal alignment with said slits.

3,908,892

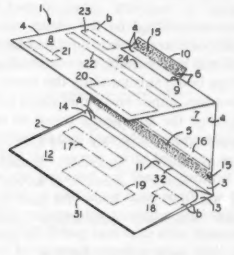
ENVELOPE DEVICE

Rudolph H. Pelzer, 7 Prospect Ter., Yonkers, N.Y. 10705

Filed Mar. 4, 1974, Ser. No. 447,856

Int. Cl.[2] B65D *27/06, 27/16, 27/04*

U.S. Cl. 229—73 **10 Claims**



1. Envelope device for original and return mail usage which comprises means defining an envelope provided with a closure flap and a foldable tear sheet extension readily detachably connected to said flap and including a proximate section adjacent said flap and a distal section remote from said flap, the delineation between said sections being defined by a common fold line for folding said distal section for movement to a position enclosed between said envelope and said proximate section, and means defining an aperture extending from said fold line into said distal section and an attachment tab connected to and extending from the portion of said proximate section at said fold line adjacent said aperture and projecting from said fold line into said aperture when said sections and said tab are disposed in a common plane and projecting freely beyond said fold line for attachment of said tear sheet extension to said envelope when said distal section is folded and moved to such position enclosed between said envelope and said proximate section.

3,908,893

AUTOMATIC SERUM PREPARATION STATION

Melvin Williams, 840 Elmwood, Evanston, Ill. 60202

Division of Ser. No. 351,631, April 16, 1973, Pat. No. 3,838,809. This application July 10, 1974, Ser. No. 487,317

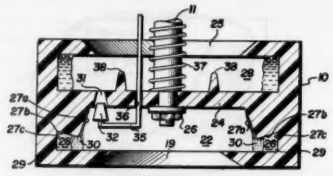
Int. Cl.[2] B04B *1/04*

U.S. Cl. 233—20 R **10 Claims**

1. A centrifuge apparatus for centrifugally separating a sample mixture into its lighter and heavier components, the apparatus comprising:

a centrifuge drum having a separation chamber and an aspiration chamber positioned directly above the separation chamber, the centrifuge drum further having a common wall separating the separation chamber and the aspiration chamber,

the separation chamber having a bottom end wall and a truncated conical interior side wall having a top edge adjacent the common wall and a larger diameter bottom edge and further having a trap portion located at the bottom edge of the interior side wall and adjacent the bottom end wall, the trap portion having a larger diameter than the bottom edge of the interior side wall;



valve means in the common wall for selectively interconnecting the separation chamber and the aspiration chamber;

a motor for spinning the centrifuge drum to force the heavier components into the trap portion while the lighter components are forced up the conical interior side wall; and

a trigger mechanism for opening the valve means to pass the lighter components through the common wall while the centrifuge drum is spinning and closing the valve means when the rate at which the centrifuge drum is spinning falls below a desired level.

3,908,894

AUTOMATIC MONEY-DISPENSING SYSTEM

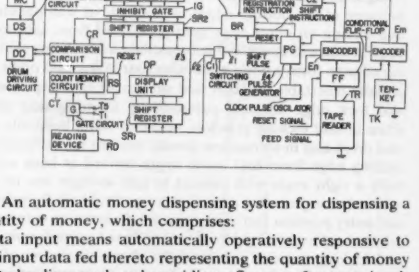
Yoshihiro Hatanaka; Hideto Shigemori, and Akio Ueba, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 179,045, Sept. 9, 1971, Pat. No. 3,784,790. This application Oct. 16, 1973, Ser. No. 406,869

Claims priority, application Japan, Sept. 11, 1970, 45-79763

Int. Cl.[2] G06K *7/08;* **G07F** *1/06;* **G06K** *7/14;* **H04Q** *3/72*

U.S. Cl. 235—61.6 R **8 Claims**



1. An automatic money dispensing system for dispensing a quantity of money, which comprises:

data input means automatically operatively responsive to input data fed thereto representing the quantity of money to be dispensed, and providing a first set of output signals representative thereof;

manually operable input means for manually designating the quantity of money to be dispensed and providing a second set of output signals representative thereof;

money dispensing means operatively associated with said data input means and said manually operable input means for dispensing the quantity of money in response to a respective one of said first set and second set of output signals; and

input switching means operatively associated with said data input means and said manually operable input means for selectively switching said first set of output signals and said second set of output signals to said money dispensing means, whereby said money dispensing means selectively dispenses the amount of money in response to a selected respective one of said first set and said second set of output signals.

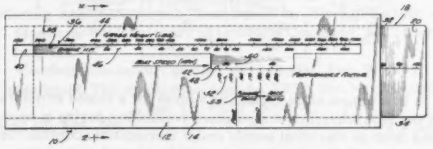
3,908,895
SLIDE RULE FOR COMPUTING MOTOR BOAT PERFORMANCE

Lars E. Granholm, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 405,041, Oct. 10, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,588

Int. Cl.[2] G06G *1/02*; **G06C** *3/00*

U.S. Cl. 235—70 A **9 Claims**



1. A slide rule device for computing performance of a motor boat comprising a first member, a second member mounted for movement relative to said first member, a first logarithmic scale on said first member and having graduated units for indicating boat gross weight in pounds, a second logarithmic scale on said second member and having graduated units for indicating engine horsepower, said first and second scales being adjacent with said graduated units thereof being alignable by relative movement of said members, a third logarithmic scale on said second member and having calibrated units for indicating boat speed in miles per hour, and a fourth logarithmic scale on said first member and having graduated units for indicating a boat performance factor which is indicative of boat efficiency, said third and fourth scales being adjacent with said graduated units thereof being alignable by relative movement of said members, one of said first and second scales including portions of first and second successive logarithmic cycles of the same length and the other of said first and second scales including a portion of a logarithmic cycle of the same length as said logarithmic cycles of said one scale, said third and fourth scales including a portion of a logarithmic cycle having a length twice that of said logarithmic cycles of said first and second scales, and said first, second, third, and fourth scales being interrelated such that, when said graduations of said other of said first and second scales are aligned with said graduations of said second logarithmic cycle of said one scale, said graduations of said third and fourth scales are aligned, whereby said performance factor is equal to boat speed in miles per hour times the square root of the quotient of boat gross weight in pounds divided by engine horsepower.

3,908,896
DIGITAL RESOLVER FILTER AND RECEIVER USING SAME

Jean Louis Monrolin, Tourettes sur Loup Alpes Maritimes, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,334

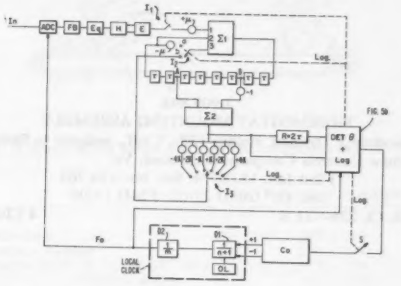
Claims priority, application France, May 11, 1973, 73.17607

Int. Cl. H04b *3/14*; **G05b** *13/02*

U.S. Cl. 235—152 **27 Claims**

1. A digital filter of the purely recursive type, comprising a recursive loop including:

at least one adder stage and a delay means the output of which is fed back to the input of said adder stage for extracting from the input signal a sine wave component, said recursive loop further including a means for shifting the phase of said sine wave component by a predetermined increment value, said means for shifting the phase of said sine component including means for extracting from said delay line signal samples of the signal which are out of phase relatively to the sample coming out of said line, by ¼ and ¾ of a period, respectively;



means for subtracting said samples from each other;

weighting means and means for applying to the result of said subtracting operation a weighting coefficient proportional to the desired phase shifting increment before applying the new sample thus determined to the input of said adder together with the sample coming out of said shift register; and

means for repeating this operation until the first sample processed appears in the last stage of said shift register.

3,908,897
OFF-LINE INTEGRATION OF BRIDGE AND BOILER CONTROLS

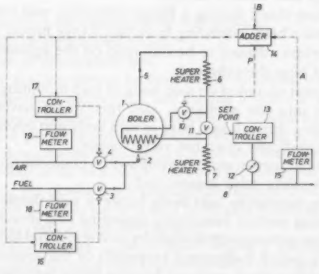
Leopold C. van Holtz, and Adrianus G. Hop, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 26, 1973, Ser. No. 428,286

Claims priority, application Netherlands, Dec. 21, 1972, 7217434

Int. Cl.[2] F23H *1/08*

U.S. Cl. 236—14 **7 Claims**



1. A process for the automatic control of a steam generator operating under varying load conditions, said process comprising:

measuring the exit steam pressure from the generator;

comparing the measured steam pressure with the desired steam pressure and generating a correcting signal P;

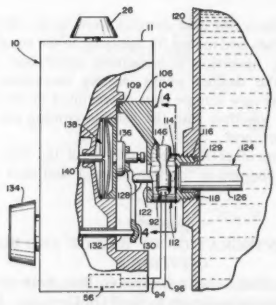
measuring the steam flow from the generator and generating a signal A related thereto;
measuring the change in steam flow and generating a signal B related to the rate of chang in the steam flow;
algebraically adding the signals P, A and B to obtain a control signal; and
using the control signal to control the fuel and air flow to the combustion process of said generator.

3,908,898

THERMOSTAT MOUNTING ASSEMBLY

Theodore J. Dykzeul, Rolling Hills, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 18, 1974, Ser. No. 434,702
Int. Cl.[2] G05D *23/02;* **F24D** *17/00*
U.S. Cl. 236—21 B **4 Claims**



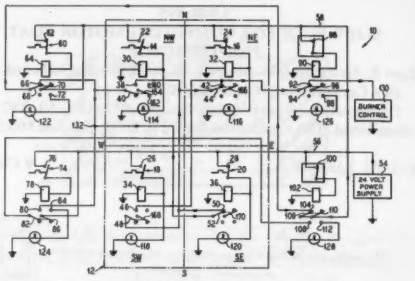
1. A thermally responsive assembly for controlling fuel flow to an appliance comprising
a control device housing thermostatically operated valve means and safety valve means therein for controlling flow through said control device;
a mounting shank having a flange mounting said control device and a body extending from said flange having a mounting portion adapted to be mounted on the appliance and a central bore therethrough;
a thermostat mounted on said body of said mounting shank to extend into the appliance, said thermostat having means extending through said bore in said body and operating said thermostatically operated valve means;
an abnormal temperature sensing switch controlling operation of said safety valve means; and
a housing carried by said body between said flange and said mounting portion removably mounting said abnormal temperature sensing switch whereby said abnormal temperature sensing switch is disposed externally of the appliance;
said mounting shank and said housing being integrally formed as a one-piece structure;
said body having an externally threaded portion defining said mounting portion and a smooth cylindrical portion joining said threaded portion and said flange and having a recess therein, said housing being disposed in said recess; and
said recess and said housing being disposed on an axis transverse to an axis defined by the central bore of said body.

3,908,899

HEATING AND COOLING CONTROL SYSTEM FOR RESIDENTIAL APARTMENT OR OTHER MULTI-SPACE BUILDINGS

Everett L. Millard, 1623 Sylvester Pl., Highland Park, Ill. 60035

Filed July 12, 1974, Ser. No. 488,253
Int. Cl.[2] F24D *12/00;* **G05D** *23/275*
U.S. Cl. 236—46 **10 Claims**



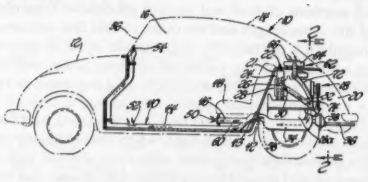
1. In a temperature regulating system for a closed structure of the type wherein a temperature controlling device is operated from an electrical supply under thermostatic control, the improvement therein of a thermostatic control comprising:
a polygonal matrix of separately located thermostatic control devices, and
electrical connections forming a series-parallel arrangement of said thermostatic control devices between the electrical supply and the temperature controlling device such that operation of at least two adjacently located ones of said thermostatic control devices is necessary to establish a circuit to operate the temperature controlling device.

3,908,900

RECIRCULATING AUTOMOTIVE HEATING SYSTEM

James R. Smith, 2104 S. Long Lake Rd., Fenton, Mich. 48430

Filed Apr. 29, 1974, Ser. No. 464,920
Int. Cl.[2] B60H *1/02*
U.S. Cl. 237—12.3 A **20 Claims**



1. A recirculating heating system for a vehicle having an enclosable passenger compartment comprising: heat exchange means for heating ambient air, primary blower means having an inlet side and an outlet side, supply duct means for conducting ambient air from the outlet side of said primary blower means to said heat exchange means, air distribution means connected to said heat exchange means for conducting heated air to the interior of the passenger compartment of the vehicle, and air recirculating means including secondary blower means having inlet means and outlet means, said inlet means communicating with the interior of the passenger compartment, and return air duct means connected to said outlet means of said secondary blower means for conducting air to said heat exchange means, said return air conducting means communicating with said supply duct means on the outlet side of said primary blower means.

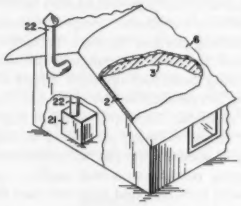
12. An air recirculating assembly adapted for use in combination with a vehicle including an enclosable passenger com-

partment, an air-cooled engine having an engine cooling blower, and a heating system including at least one heat exchanger in heat exchange relationship with the engine for heating ambient air, a supply duct for conducting ambient air to the heat exchanger from the outlet side of the engine cooling blower, and an air distribution network for conducting heated air from the heat exchanger to the passenger compartment; said assembly comprising recirculating blower means having inlet means and outlet means, said inlet means being adapted for communication with the passenger compartment of the vehicle, and return air duct means adapted for connection between said outlet means of said recirculating blower means and the supply duct on the outlet side of the engine cooling blower for conducting air from the passenger compartment to the heat exchanger.

3,908,901
SNOW LOAD REMOVAL

Morton Austin Newcomb, and Johan A. Bjorksten, both of Madison, Wis., assignors to Griffolyn Company, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 113,904, Feb. 9, 1971, abandoned. This application Aug. 14, 1973, Ser. No. 388,090
Int. Cl. F24d *15/00*
U.S. Cl. 237—81 **1 Claim**



1. The method of removing snow from a building roof by heating the interior of the building and transmitting heat through the roof to the snow from said interior to melt the snow and cause it to run off as water, characterized by:

the step of regulating the rate of heat flow to the snow in proportion to the amount of snow present, further characterized by:

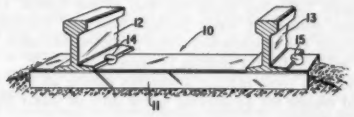
regulating said rate of heat flow automatically in response to the amount of snow present in order to provide a snow removal rate proportional to the amount of snow present to provide minimum total heat usage for snow removal and minimum heat loss in the absence of snow and to automatically prevent large accumulations of snow, said proportionality being non-linear,

characterized by providing a roof structure having a thermal conductivity non-linearly inversely proportional to the weight of snow on the roof and which responds to snow on the roof by becoming thinner and correspondingly more thermally conductive in response to the weight of the snow thereon and which responds to removal of snow from thereon by becoming thicker and correspondingly less thermally conductive in response to removal of the wieght of the snow from thereon.

3,908,902
MOLDED OR EXTRUDED SYNTHETIC RAILROAD TIES, BEAMS AND STRUCTURAL MEMBERS

Benjamin P. Collins, Turners Falls, Mass., and John J. Novello, Weston, Conn., assignors to Collins Synthetics, Inc., New Haven, Conn.

Filed Oct. 26, 1973, Ser. No. 410,171
Int. Cl.² E01B *3/02*
U.S. Cl. 238—83 **4 Claims**



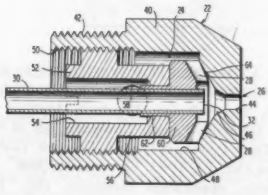
1. A waste wood structural member composed of:

		Percentage by Weight
Waste wood		38% – 65%
Aluminum hydrate		25% – 23%
Polyester resin GR 117 or GR 14010		35% – 10%
	Dimethyl aniline	1% — 1%
Catalyst		
	Benzyl peroxide powder mixed with	1% — 1%

3,908,903
SNOW MAKING APPARATUS AND METHOD

Samuel L. Burns, Jr., 1696 Carruthers Place, Memphis, Tenn. 38112

Filed Feb. 11, 1974, Ser. No. 441,624
Int. Cl.² F25C *03/04*
U.S. Cl. 239—2 S **11 Claims**



1. Apparatus for making snow comprising:

a source of pressurized water;

a source of pressurized gas;

a snow making device located in an atmosphere having a temperature below 0°C. and having a water channel including a hollow annular chamber, a central exit nozzle with a predetermined diameter and having a flow axis, and flow channels including a fixed wall transverse to the flow axis of the exit nozzle between said chamber and said nozzle for producing a substantially hollow conical spray pattern of water particle flow from said nozzle to become supercooled in said atmosphere;

said device having a gas conduit having a discharge end extending through said transverse wall, sealingly engaged thereby and including a gas discharge opening with an internal diameter at least as large as the central exit nozzle diameter and being oriented to direct gas flow through said exit nozzle along the axis of said conical spray pattern, and means locating the discharge end of said gas conduit at a location near the entrance area of said exit nozzle and in alignment with the flow channels but without perceptibly affecting the hydraulic characteristics of

the water flow through said exit nozzle when there is no gas flow through said conduit;

means for connecting said water source to the water channel of said device; and

means for connecting said gas source to the gas conduit of said device, the pressure of the gas in said conduit being sufficiently high so that the gas flow rate at the exit nozzle is restricted by the water flowing through the exit nozzle by an amount to reduce the gas temperature sufficiently far below 0°C. to cause ice nuclei to form in the gas stream following along the axis of the hollow conical spray pattern of water particle flow and thereafter to convert the supercooled water particles into snow.

8. A method for the making of snow comprising:

providing a snow making apparatus having an exit nozzle and means for generating spiral flow of water through said nozzle;

applying water at a temperature greater than 0°C. to said apparatus at a pressure and flow rate to create a predominantly hollow conical pattern of water particle flow from said nozzle into an atmosphere having a temperature less than 0°C.;

providing a gas supply conduit having a gas discharge opening sufficiently large so as not to materially restrict the gas flow rate;

locating the axis of the opening in said gas supply conduit near the center of the spiral water flow at said exit nozzle and orienting the conduit opening to direct the gas flow substantially along the direction of the axis of said hollow conical pattern of water particle flow; and

supplying gas to the gas supply conduit at sufficient pressure and temperature to accelerate the gas to a high velocity centrally of the spirally flowing water in the nozzle thereby entraining in the gas water particles from the gas-water interface and crystallizing the entrained water particles; and

exhausting the gas, the entrained crystallized water particles, and the liquid water from the nozzle into the atmosphere whereupon the crystallized water particles interact with the conical pattern of water particle flow to generate snow.

3,908,904

ULTRASONIC ATOMIZER FOR WASTE SULFURIC ACID AND USE THEREOF IN ACID CRACKING FURNACES

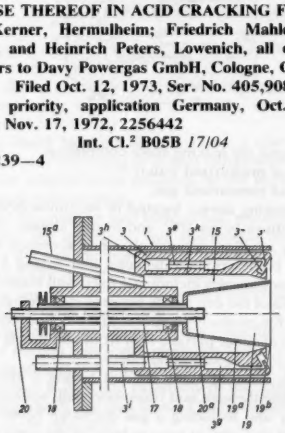
Walter Kerner, Hermulheim; Friedrich Mahler, Cologne-Nippes, and Heinrich Peters, Lowenich, all of Germany, assignors to Davy Powergas GmbH, Cologne, Germany

Filed Oct. 12, 1973, Ser. No. 405,908

Claims priority, application Germany, Oct. 14, 1972, 2250521; Nov. 17, 1972, 2256442

Int. Cl.² B05B *17/04*

U.S. Cl. 239—4 **10 Claims**



1. A method of atomizing in a furnace aqueous waste sulfuric acid containing suspended solids or dissolved salts which precipitate upon atomization of the acid which comprises the combination of steps of first mechanically converting a feed stream of the aqueous acid into a coarse spray and further atomizing the coarse spray by passing it through a field of ultrasonic sound.

3,908,905

DEMOUNTABLE MULTI-PART CONTAINER ASSEMBLY

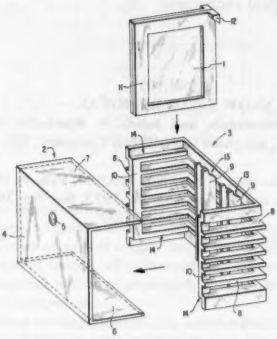
Fritz Von Philipp. Neuburg, Donau, and Georg Schimanski, Rummenohl, both of Germany, assignors to Globol-Werk GmbH, Neuburg, Donau, Germany

Filed Dec. 20, 1973, Ser. No. 426,541

Claims priority, application Germany, Dec. 20, 1972, 2262378

Int. Cl.² A61L *9/04*

U.S. Cl. 239—55 **3 Claims**



1. A demountable multi-part container assembly for accommodating a volatile substance, comprising in combination:

a. a first housing portion having a rectangular rear wall, a rectangular floor and a rectangular lid; said floor and said lid extending from two opposite edges of said rear wall and being perpendicular thereto; said floor and said lid being of identical shape and being in alignment with one another; means defining an orifice in said rear wall for receiving a securing means to permanently attach said first housing portion to a wall surface in a face-to-face engagement between said rear wall and the wall surface;

b. a second housing portion having a rectangular front wall and two rectangular side walls; said rectangular side walls extending from two opposite edges of said front wall and being perpendicular thereto; said side walls being of identical shape and being in alignment with one another; each said side wall including shoulders extending from said front wall along opposite edges of each said side wall; each shoulder being arranged for supporting opposite marginal zones of said floor and said lid of said first housing portion; said marginal zones extending from said rear wall of said first housing portion; said front wall and said two side walls being formed by rectangularly bent, continuous, parallel-spaced slats interconnected by two terminal strips constituting an edge zone of each said side wall; said strips extending perpendicularly to said slats and said shoulders; said second housing portion being slidable onto said first housing portion and being supported thereon by the cooperation between said shoulders of said second housing portion and said marginal zones on the floor and the lid of said first housing portion;

c. a guide rail affixed to said front wall of said second housing portion and extending perpendicularly to said slats; said guide rail including means defining an open, longitudinal channel oriented towards said rear wall of said first housing portion when said second housing portion is supported by said first housing portion; and

d. a volatile substance carrier including a flat, rectangular handling frame surrounding the substance and having handling surfaces being out of contact with the substance,

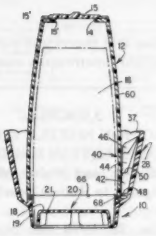
an edge zone of said frame being slidably received in said channel of said guide rail for orienting said flat frame in a plane parallel to said side walls of said second housing portion; a securing means attached to said frame in said edge zone thereof for cooperating with said guide rail for immobilizing said frame in said guide rail.

3,908,906

AIR FRESHENER CONTAINER OR VAPOR DIFFUSING DEVICE

William G. Crowle, Deerfield, and Efrem M. Ostrowsky, Highland Park, both of Ill., assignors to VCA Corporation, Baton Rouge, La.

Filed July 5, 1974, Ser. No. 485,943
Int. Cl.² A61L *9/04*
U.S. Cl. 239—58 **12 Claims**



1. A vapor diffusing device compirsing a base and a closure or cover which are detachable from each other, said base having a bottom wall and an upstanding annular side wall with said upstanding sidewall having spaced openings therein, means on the interior of said upstanding sidewall providing a plurality of vertically spaced apart ledges, said cover adapted to be positioned so that when in its fully lowered position the cover provides vapor sealing engagement with said base and when said cover is raised with respect to said base it is supported in its raised position on said vertically spaced ledges to provide vapor passages through said spaced openings.

3,908,907

MACHINE FOR WASHING THE UNDER PARTS OF VEHICLES IN GENERAL

Manuel Carlos Beltran, Buenos Aires, Argentina, assignor to Fabril Automaq S.A.I.C.A.F.I., Buenos Aires, Argentina

Filed Dec. 17, 1974, Ser. No. 533,593
Claims priority, application Argentina, Dec. 18, 1973, 251602
Int. Cl.² B05B *3/18*
U.S. Cl. 239—184 **4 Claims**

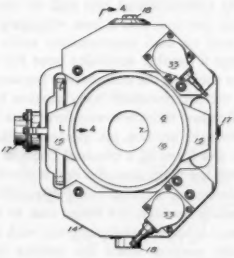
1. An improved machine for washing the under parts of vehicles in general which is housed inside a longitudinal recess of quadrangular section and comprises a pair of rails on which a carriage bearing a frame is displaced linearly in an alternating manner, said frame comprising a sprinkler head to which is coupled a hose conveying the liquid under pressure, characterized in that two carriages bearing sprinkler elements are provided and they are rigidly connected together by means of a longitudinal rigid strap keeping the carriages disposed in two outer parts of the recess and further in that the end of the rails and in correspondence with each of the carriages, reels are provided about which the hoses corresponding to the sprinkler of each carriage are adapted to be wound and unwound with the cooperation of respective guide members, said hoses being connected to respective rotary sockets coaxially interposed in the columns supplying the liquid under pressure, said columns also constituting the respective axes of each reel, to which, in turn, the ends of corresponding draw cables are attached at a lower supporting part of each reel with a different winding direction to the hoses, said draw cables extending to the center of the recess in which the unit is lodged until it passes round a transversal drive roller and returns so that its opposite end is attached to the frame of the respective carriage; at least said reels having been provided with an integral and coaxial pulley connected by transmission means to another pulley or larger diameter integral with a cam shaft capable of acting on elements for controlling the operation, the interruption and reversing of the movement of the motor connected to said transversal and central drive roller.

3,908,908

GIMBALED NOZZLE FOR ROCKETS

Wendell O. Johnson, Brigham City, Utah, assignor to Thiokol Corporation, Bristol, Pa.

Filed June 5, 1970, Ser. No. 43,739
Int. Cl. B64c *15/04*
U.S. Cl. 239—265.35 **3 Claims**



1. In a gimbaled thrust nozzle for rockets, having a de Laval nozzle, a gimbal ring surrounding and pivotally attached to the de Laval nozzle, and a blast tube, attachable to a rocket, surrounding the de Laval nozzle and pivotally attached to the gimbal ring at right angles to its attachment to the de Laval nozzle, the improvement comprising:

a first pair of single-acting, hydraulic cylinders fixed to the gimbal ring and circumferentially spaced at right angles to the pivotal attachment of the gimbal ring to the de Laval nozzle and operatively attached to the exit cone thereof, and

a second pair of single-acting, hydraulic cylinders fixed to the gimbal ring and circumferentially spaced at right angles to the first and operatively attached at one end to the blast tube.

3,908,909

ANCHORING DEVICE FOR A FLEXIBLE SPRINKLER HOSE

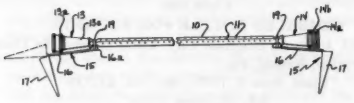
Robert H. Kaatz, 6505 Parkwood Rd., Minneapolis, Minn. 55436

Filed Apr. 19, 1974, Ser. No. 462,216
Int. Cl.² B05B *15/06*
U.S. Cl. 239—276 **10 Claims**

1. In combination with a flexible sprinkler hose having openings at spaced locations therealong for emitting water in a fine spray and a rigid end fitting on at least one end of the

sprinkler hose, an anchoring device for anchoring the flexible sprinkler hose comprising, a one-piece body of resilient plastic material having an elongated intermediate body portion extending lengthwise of the hose in underlying relation to the rigid end fitting; an elongated anchor pin portion integrally connected at one end to one end of said intermediate body portion by a thin flexible connection portion forming a hinge extending transverse to said anchor pin portion at a location beyond the outer end of the end fitting to allow swinging of said anchor pin portion between a position extending generally lengthwise of said intermediate body portion and a position extending transverse to said intermediate body portion at one side of the latter; and a hose engaging portion integral with said intermediate body portion adjacent its other end and defining a loop extending in a plane crosswise of said elongated intermediate body portion at the other side thereof and encircling the flexible sprinkler hose adjacent the rigid end fitting for attaching the anchoring device thereto.

9. An anchoring device for a flexible sprinkler hose comprising, a one-piece body of resilient plastic material having an



elongated intermediate body portion; an elongated anchor pin portion integrally connected at one end to one end of said intermediate body portion; and a hose engaging portion integral the other end of said intermediate body portion and adapted to engage a flexible sprinkler hose for attaching the anchoring device thereto, the connection between the anchor pin portion and the intermediate body portion being notched to define a thin flex line therebetween forming a hinge extending transverse to said anchor pin portion, said anchor pin portion being in the form of a channel open at one side and tapering in a direction from said one end toward its distal end and the open side of the channel being disposed substantially in a plane extending through the hinge axis so that the open side of the channel is substantially aligned with the elongated intermediate body portion when the anchor pin portion is positioned to extend lengthwise of the intermediate body portion in a direction away from said other end thereof, the anchor pin being movable to a position extending transverse to the intermediate body portion at one side of the latter with the open side of the channel facing in a direction toward said other end of the intermediate body portion.

3,908,910

CLEANING TOOL FOR GUTTERS AND EAVETROUGHS

Melvin F. Detwiler, 1715 Harding Ave., Lansing, Mich. 48910

Filed June 20, 1974, Ser. No. 481,341

Int. Cl.² B05B *09/08*

U.S. Cl. 239—280 **2 Claims**

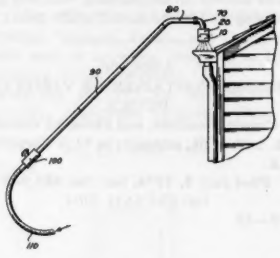
1. A device for use in combination with conventional garden hoses to clean gutters and eavetroughs on houses, comprising:

a downwardly directed spray head;

a swivel connector connected to the spray head, the connector allowing the spray head to be pivoted in a single vertical plane;

a hollow pipe attached to the connector and having two elongated sections fixedly attached to each other and occupying a common vertical plane perpendicular to the plane in which the spray head may be pivoted, the first section being attached to the connector and lying in a horizontal plane and the second section being connected to the first section and extending downwardly therefrom; and

a coupling attached to the lower end of the second section of pipe for detachably securing a conventional garden



hose to the pipe and thereby introducing water into the pipe to be sprayed downwardly out of the spray head.

3,908,911

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

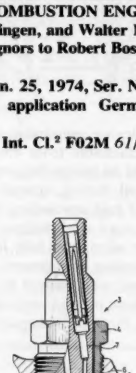
Karl Hofmann, Aldingen, and Walter Mladek, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 25, 1974, Ser. No. 436,783

Claims priority, application Germany, Jan. 25, 1973, 2303506

Int. Cl.² F02M *61/04*

U.S. Cl. 239—533 **1 Claim**

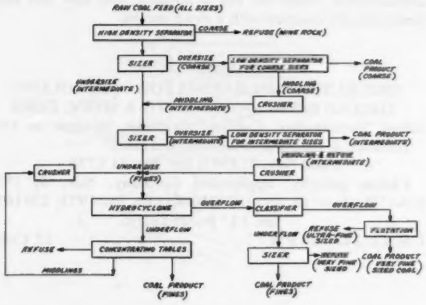


1. In a fuel injection nozzle which is fastened to a cylinder head of an internal combustion engine having a nozzle holder and a hollow screw for fastening the nozzle to the cylinder head, the improvement comprising an annular groove extending into the nozzle holder from the outer surface thereof and a snap ring device which partially and radially engages the annual groove, said snap ring device having a circular cross section, wherein the hollow screw is provided with an internal groove extending into the hollow screw from the inner surface thereof, said internal groove covering a portion of the snap ring in its circumferential direction and securing it with respect to radial deflection, and wherein said internal groove is tapered in the axial direction of the nozzle facing away from the engine such that the snap ring device is radially tensioned when the nozzle is axially fastened to the cylinder head.

3,908,912
COAL BENEFICIATING PROCESS

Stanton D. Irons, Northampton, and Francis G. Miller, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Sept. 17, 1974, Ser. No. 506,822
Int. Cl.² B02C *21/00*
U.S. Cl. 241—20 **2 Claims**



1. A method for recovering high quality coal from a raw coal ore feed, which feed comprises a high middlings content, comprising:

a. separating a raw coal ore feed into high density mine rock and a raw feed material consisting substantially of coal and middlings,

b. discarding the high density mine rock,

c. sizing the raw feed material from (a) to recover a coarse coal product which is separated from coarse middlings,

d. crushing the coarse middlings from (c) to provide a feed ranging in average size from intermediate to fine,

e. sizing the feed from step (d) at a finer mesh than the sizing of step (c) to recover an intermediate sized coal product which is separated from an intermediate sized middlings,

f. crushing the intermediate sized middlings from (e) to a fines size to provide a fines feed including coal, middlings and high density refuse,

g. separating the fines feed from step (f) to produce a fines product fraction and a refuse fraction,

h. treating the product fraction from step (g) by a flotation step to recover coal,

i. separating the refuse fraction from step (g) to produce three separate material fractions, including first sized coal values which are recovered, refuse which is discarded and middlings, and

j. crushing the middlings of step (i) and recycling the crushed material to step (g).

3,908,913
SHREDDER ATTACHMENT FOR ROTARY MOWERS

Maurice E. Cushman, R.D. No. 4, P.O. Box 348, Fey Rd., Chestertown, Md. 21620

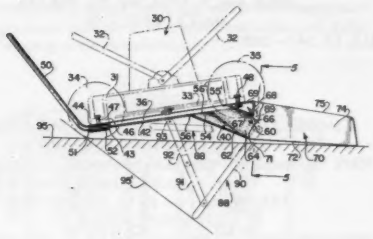
Filed Aug. 29, 1974, Ser. No. 501,822
Int. Cl.² B02C *18/22*
U.S. Cl. 241—101.7 **22 Claims**

1. A shredder attachment for a rotary mower, having a housing defining a chamber with an open bottom side and a side wall, a discharge opening through said side wall, and a rotary blade adapted to rotate within said chamber, comprising:

a plate for covering said open bottom side of said chamber, said plate having an intake opening;

an intake duct extending from said plate between said intake opening and a duct inlet end; and

an apron for receiving material to be shredded, said intake duct being connected between said apron and said plate and communicating with said apron at its inlet end and with said intake opening at said plate to guide material to be shredded along a path from said apron through said intake opening into said chamber, said intake opening

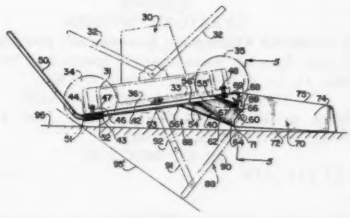


and duct being so shaped and positioned that said rotary blade will be inhibited from driving material fed into said chamber back towards the inlet end of said duct.

3,908,914
SHREDDER ATTACHMENT FOR ROTARY MOWERS

Maurice E. Cushman, R.D. No. 4, Box 348, Fey Rd., Chestertown, Md. 21620

Continuation-in-part of Ser. No. 501,822, Aug. 29, 1974, Pat. No. 3,908,913. This application Jan. 9, 1975, Ser. No. 539,688
Int. Cl.² B02C *21/02*
U.S. Cl. 241—101.7 **5 Claims**



1. A shredder attachment for a rotary mower, having a housing defining a chamber with an open bottom side and a side wall, a discharge opening through said side wall, and a rotary blade adapted to rotate within said chamber, comprising:

a plate for covering said open bottom side of said chamber, said plate having an intake opening;

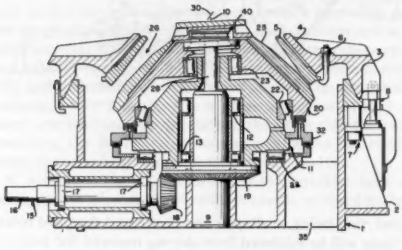
an intake duct extending from said plate between said intake opening and a duct inlet end; and

an apron for receiving material to be shredded, said intake duct being connected between said apron and said plate and communicating with said apron at its inlet end and with said intake opening at said plate to guide material to be shredded along a path from said apron through said intake opening into said chamber, said intake opening and duct being so shaped and positioned that said rotary blade will be inhibited from driving material fed into said chamber back towards the inlet end of said duct, said duct including reentry ramp means at the downstream side of said intake opening with respect to the direction of rotation of said rotary blade for deflecting air and particles deflected tangentially from said blade back into said chamber, said reentry ramp means comprising a planar wall portion of said duct extending substantially at an angle of 45° with respect to said plate.

3,908,915
ANTIROTATION DEVICE FOR A GYRATORY CRUSHER

Veljko Milenkovic, Glencoe, Ill., assignor to Fuller Company, Catasauqua, Pa.

Filed Aug. 7, 1974, Ser. No. 495,344
Int. Cl.[2] B02C *2/06*
U.S. Cl. 241—208 15 Claims



1. In a rock crusher of the type having a bowl and a head cooperable with the bowl in crushing operation;

rotary means rotatable in a first direction for causing said head to gyrate relative to said bowl;

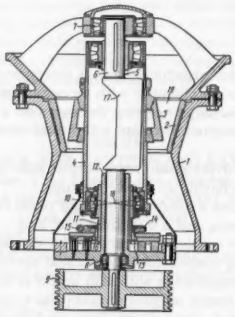
means mounting said head for rotary movement relative to said rotary means; and

means operatively connected to said head for limiting the speed of rotation of said head in said first direction and permitting free rotation of said head in the other direction.

3,908,916
GYRATORY CRUSHER

Boris Vasilievich Klushantsev, Komsomolsky prospekt, 25, kv. 38, and Genrikh Alexandrovich Speransky, Nezhinskaya ulitsa, 13, kv. 463, both of Moscow, U.S.S.R.

Filed Nov. 7, 1973, Ser. No. 413,454
Claims priority, application U.S.S.R., June 12, 1973, 1921902; June 12, 1973, 1921903
Int. Cl.[2] B02C *2/06*
U.S. Cl. 241—213 1 Claim

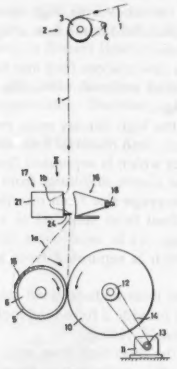


1. A gyratory crusher comprising: a frame having an upper and lower portion; a stationary crushing bowl; a movable crushing head cooperating with the stationary crushing bowl and having a substantially vertically disposed hollow shaft whose lower end is supported for gyratory motion in the lower portion of said frame; a substantially vertically disposed eccentric shaft having an eccentric on its upper end which end is disposed in the upper portion of said frame, said eccentric shaft passing through the hollow space of said hollow shaft, said hollow shaft being coupled at its upper end with said eccentric; drive means provided in the lower portion of said frame and kinematically coupled with the lower end of said eccentric shaft; said hollow shaft being supported for gyratory motion at its lower end on a sleeve; said sleeve being concentrically mounted with respect to the eccentric shaft so as to permit longitudinal movement thereof and having screw threads and a nut mounted on said screw threads in rotational engagement therewith; said nut being secured to the lower portion of said frame to prevent the nut from longitudinal displacement when the nut is rotated; and said nut being kinematically coupled with a drive means.

3,908,917
DEFLECTING MECHANISM FOR CONTROLLING THREAD BEING WOUND ONTO A SPOOL CORE

Alfred Tschentscher, Cologne, Germany, assignor to FMN Schuster & Co., Hurth-Efferen, Germany

Filed Nov. 7, 1973, Ser. No. 413,738
Claims priority, application Germany, Nov. 9, 1972, 2254736; June 18, 1973, 2331006; Oct. 11, 1973, 2351039
Int. Cl.[2] B65H *54/34*
U.S. Cl. 242—18 PW 17 Claims



1. An apparatus for forming a reserve winding during the initial winding of a thread onto a spool core having a thread package winding area, said apparatus comprising:

a. means for delivering a supply of thread to a spool core at an end location axially displaced from said winding area,

b. means for forming a reserve winding at said end location of the spool core,

c. a traversing device for directing the supply of thread from the reserve winding of said end location to the winding area along the spool core to form a thread package, and

d. a deflecting mechanism located at said end location for effecting a short-time duration of deflection along the length of the thread at said end location spaced away from the spool core only during the time period while the thread is in an untensional condition when the end of the thread is initially secured to the spool core winding.

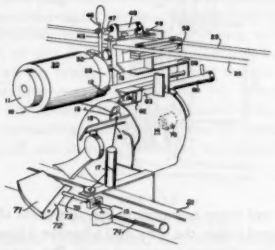
3,908,918
DOFFING MEANS FOR THE PACKAGE WOUND ON A STRAND WINDING MACHINE

Gunnar A. Bergstrom, 248 Church Ave., Warwick, R.I. 02889

Filed Apr. 18, 1974, Ser. No. 461,933
Int. Cl.[2] B65H *54/02*, *67/04*
U.S. Cl. 242—18 R 4 Claims

1. A doffing means for a strand winding machine having a driven package spindle supported at one end and free at the other end, a strand package measuring means for stopping said spindle at a predetermined package size, and a strand

traversing frame, that improvement which comprises means for swinging the strand traversing frame from the package spindle, strand cutting means and strand clamping means reciprocably mounted to move parallel to the axis of said spindle and between the frame and the package after the traversing frame is swung away from the package to engage the strand as lead from a supply source to the package spindle, means to operate said cutting and clamping means to cut and clamp the strand, releasable strand clamping means mounted



on said spindle to rotate therewith, means to release said rotatable clamping means after stopping of the spindle, a plate adjacent the driven end of the spindle and reciprocably mounted to move parallel to the axis of the spindle and engage the strand package to slide it off the free end of the spindle, means to reciprocate said plate during stopping of the spindle, said rotatable clamping means clamping the leading end of the strand after the reciprocable clamping means retracts and the traversing frame is swung back adjacent the spindle.

3,908,919

CASING FOR A WINDING APPARATUS

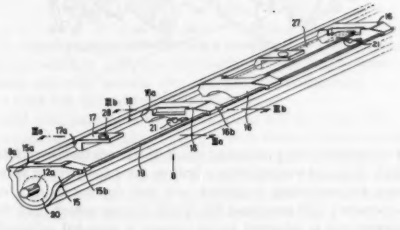
Peter Hermanns, Stommeln, Cologne, Germany, assignor to FMN Schuster & Co., Hurth-Efferen, Germany

Filed Nov. 7, 1973, Ser. No. 413,725

Claims priority, application Germany, Nov. 11, 1972, 2255258

Int. Cl. B65h *54/30*

U.S. Cl. 242—43 **16 Claims**



1. An apparatus for winding thread onto a spool comprising:

a. a casing,

b. a reverse thread roller rotatably mounted in the casing,

c. a thread guide mechanism including a thread guide element mounted for back and forth movement by means of the reverse thread roller,

d. said casing including a trough-shaped housing with a contoured inner surface and having an opening facing upwardly along the top and between longitudinal sides thereof,

e. said casing including detachably connected means for reinforcing the housing along the longitudinal edges of the opening,

f. said reinforcing means having an outer bearing surface configuration corresponding to the contoured inner surface of the housing,

g. said outer bearing surface being disposed contiguous to the inner surface of the housing,

h. said reinforcing means including wall pieces being movably disposed between said longitudinal sides and defining a winding zone therebetween.

3,908,920

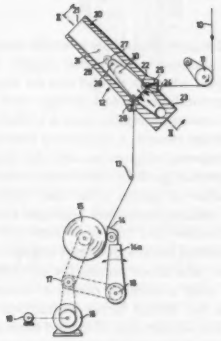
PROCESS AND APPARATUS FOR MAINTAINING CONSTANT THREAD TENSION

Peter Hermanns, Stommeln, Germany, assignor to FMN Schuster & Co., Efferen, Germany

Filed July 17, 1973, Ser. No. 380,034

Int. Cl. B65h *59/38*

U.S. Cl. 242—45 **12 Claims**



1. An apparatus for maintaining a constant thread tension while feeding a thread to a processing textile machine comprising:

a. housing means forming an open ended, elongated air channel,

b. means for moving a thread along a path transversely across the air channel at one end thereof,

c. means adjacent the channel for blowing a fluid stream against the thread to form a thread loop having an apex which moves within the air channel,

d. at least two light barrier means disposed at laterally spaced locations with respect to each other and extending in a direction across the path of movement for the apex of the thread loop within the air channel,

e. each light barrier means defining a signal point within the air channel where an electrical signal is generated by the thread loop as it passes by a signal point,

f. the electrical pulse signals generated by the thread loop at both signal points being transmitted to separate inputs of a bistable element that stores in each case the last pulse signal up to the receipt of the next signal,

g. the output of the bistable element being connected with a circuit and at the output of said circuit there is generated a voltage change dictated by the pulse sequence at the bistable element due to the pulse scanning ratio, and

h. means responsive to the electrical signals generated at the light barriers for regulating the supply of thread along its path of movement.

3,908,921
THREAD SUPPLY DEVICE FOR TEXTILE MACHINES

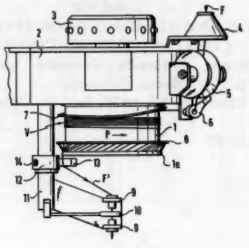
Kurt Arne Gunnar Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Mar. 8, 1974, Ser. No. 449,258

Claims priority, application Germany, Mar. 12, 1973, 2312267; Sept. 12, 1973, 2345986

Int. Cl.[2] B65H *51/20*

U.S. Cl. 242—47.01 **10 Claims**



1. In a thread supply device for a textile machine, in particular a knitting machine, said thread supply device including drum means upon which a thread can be tangentially wound to form an intermediate thread storage and from which the thread can be unwound axially over a withdrawal rim associated with the drum means, a stationary thread guide member disposed in substantial alignment with the longitudinal axis of said drum means for guiding the thread withdrawn from said drum means after it passes over the withdrawal rim, and thread control means positioned adjacent the withdrawal rim of said drum means and movable between a first position wherein said control means does not engage the thread being withdrawn from said drum means for permitting intermittent thread supply and a second position wherein the control means engages the thread being withdrawn from said drum means to limit the withdrawal of thread from said drum means substantially to the rate at which thread is wound on the drum means to thereby provide a positive thread supply, comprising the improvement wherein said thread control means includes a thread control element positioned adjacent the withdrawal rim of said drum means and mounting means supporting said thread control element for movement within a plane which is substantially perpendicular to the longitudinally extending axis of said drum means to permit movement of said thread control element between said first and second positions, said control element having a thread engaging portion which is adapted to engage the thread being withdrawn from the drum means when said thread control element is in said second position, said portion of said thread control element when in said second position preventing lateral displacement of the withdrawn thread in one rotational direction relative to said drum means while permitting lateral displacement of the withdrawn thread in the opposite rotational direction relative to said drum means.

3,908,922
APPARATUS FOR FEEDING AND UNREELING WIRE FROM A COIL

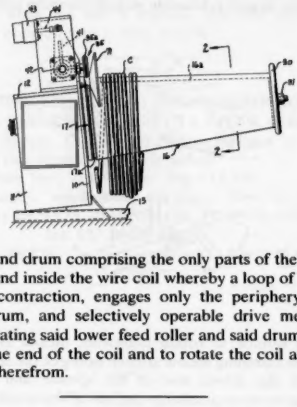
Robert M. Guthrie, and George L. Straley, both of Rockford, Ill., assignors to Fastener Engineers, Inc., Rockford, Ill.

Filed Feb. 20, 1974, Ser. No. 444,126

Int. Cl. B65h *75/00*

U.S. Cl. 242—54 R **9 Claims**

1. In an apparatus for feeding and unreeling wire from an annular coil of wire, the apparatus including a support frame, an upper and a lower feed roller mounted on the support frame for rotation about generally horizontal axes and defining a wire nip therebetween, and a wire support drum coaxial with the lower feed roller and rotatable therewith, to support a coil of wire with the coil axis generally horizontal and with the upper side of the coil at a level adjacent the level of said wire nip, the improvement wherein the lower feed roller and drum are rotatably supported only at the side of the lower feed roller opposite the drum and the lower feed roller and drum extend in cantilever fashion from the support frame, the lower



feed roller and drum comprising the only parts of the apparatus that extend inside the wire coil whereby a loop of the wire coil, upon contraction, engages only the periphery of the rotatable drum, and selectively operable drive means for drivingly rotating said lower feed roller and said drum to feed wire from the end of the coil and to rotate the coil as wire is withdrawn therefrom.

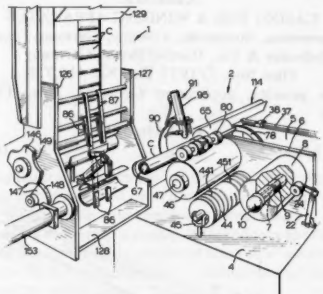
3,908,923
WINDING APPARATUS

Leslie Salgo, P.O. Box 446, Pickering, Ontario, Canada

Filed Sept. 11, 1972, Ser. No. 288,074

Int. Cl. B65h *19/20*

U.S. Cl. 242—56 R **45 Claims**



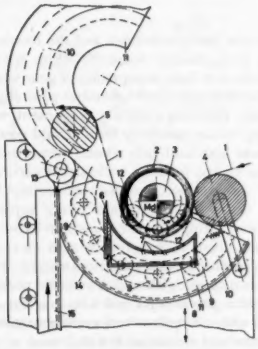
1. Apparatus for producing a roll of a predetermined length of web material wound onto a hollow core comprising spindle means for mounting a parent web roll for rotation, a core co-operating roll mounted for rotation over which web from a parent roll is adapted to be drawn, a mandril adapted to receive a core sleeved thereon mounted for rotation on an axis parallel to the axis of rotation of said core co-operating roll and for translation between a core loading an unloading station away from said core co-operating roll, and a winding position adjacent said core co-operating roll; means for rotating said mandril to rotate a core sleeved therein, means for translating said mandril, clutch means interposed between said rotating means and such sleeved core for providing limited torque transfer between said rotating means and such sleeved core, transfer means for transferring a core from a stack of cores into axial alignment with said mandril with said mandril translated to said core loading and unloading station, means for delivering an axially aligned core onto said mandril, means responsive to the delivery of a core onto said mandril

to effect translation of said mandril to said winding position to cause the core to nip a web drawn over said core co-operating roll against said roll, with the free end of the web hanging below the core, means to effect displacement of the hanging free web end in a wrapping movement about the core, means responsive to the translation of said mandril to said winding position to actuate said mandril rotating means to effect winding of the nipped and wrapped web on the core, means responsive to the winding of a predetermined length of web on the core to effect actuation of said mandril translation means to return said mandril to said loading and unloading station and to effect deactivation of said mandril rotating means, brake means for braking said mandril and parent roll spindle on deactivation of said mandril rotating means to bring web fed to a stop with the return of said mandril to said loading and unloading station, means for severing the web immediately adjacent to the wound core on the mandril with same at said loading and unloading station and means for ejecting a wound core axially off said mandril following web severance.

3,908,924
WINDING MACHINES

Wilhelm Schulze, Gruenenplan, Germany, assignor to Maschinenbau Greene GmbH & Co., KG, Kreiensen, Germany

Filed May 16, 1973, Ser. No. 360,787
Int. Cl. B65h *19/28*
U.S. Cl. 242—56 R **7 Claims**



1. Apparatus for transferring a moving web from a rotatably driven winding roll to a rotatably driven empty core over which said web travels, the combination comprising

a feed roll biased toward said core,

said web passing between said feed roll and said core,

a separating element having a web cutting edge extending traversely across said web between said winding roll and said core and further having an air chamber with air outlets for directing compressed air against said web toward and across the width of said core,

means mounting said separating element for coaxial rotation with said core,

drive means for rotating said separating element coaxially of and in the direction of rotation of said core to sever said web intermediate said winding roll and said core and to force the severed end of said web against said core in proximity to said feed roll by means of compressed air blowing the severed end portion of said web against said core,

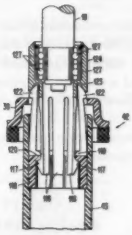
said air chamber having a concave wall partially surrounding said core through an angular distance of at least ninety degrees and defining a confined space between said wall and said core into which said air outlets open whereby said concave wall rotates around said core with said separating element to permit the air pressure built up in said confined space to hold the severed end of said web against said core,

whereby said web is transferred to said empty core without the formation of wrinkles therein.

3,908,925
TAPE CASSETTE OPENER

Helfried O. Rinkleib, and William J. Rueger, both of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1974, Ser. No. 465,645
Int. Cl.² B65H *17/02*
U.S. Cl. 242—68.3 **5 Claims**



1. A combined cover separating and spool-holding tool apparatus for operation with a circular cylindrical tape-containing cartridge having a hollow core spool covered by a tubular cover with a circular set of latching fingers on a core of said spool which radially outwardly engage an annular locking ridge on said tubular cover, said latching fingers having radially outwardly faced camming surfaces circumferentially disposed about and radially outward of a circle having a given diameter, a radially inwardly extending annular rib on said latching fingers approximately a given axial distance from said camming surfaces,

the improvement including in combination:

an annular cam having a diameter enabling said cam to coact with said latching fingers and having a maximum diameter smaller than the diameter of said annular locking ridge for exerting a given axial force on said latching fingers; and

a circular set of resilient axially extending fingers coaxial with said annular cam and extending axially outwardly thereof said given axial distance approximating the length of said latching fingers and each of said spool-holding fingers having a radially outwardly extending detent/cam portion for exerting an axial force on said spool in the direction opposite to and greater than an axial force simultaneously exerted by said annular cam.

3,908,926
ROLL SUPPORTING MECHANISM

Gordon M. Ochs, Washougal, Wash., and Raymond Wheeler, Independence, Mo., assignors to Tidland Corporation, Camas, Wash.

Filed May 17, 1974, Ser. No. 470,745
Int. Cl. B65h *75/18*
U.S. Cl. 242—72 B **10 Claims**

1. A roll supporting arrangement comprising a spindle adapted to be mounted horizontally in projecting cantilever fashion,

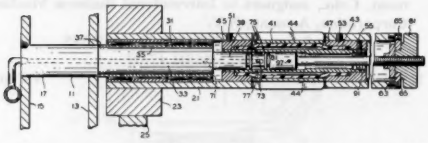
said spindle having an inboard portion and an outboard portion,

a roll supporting sleeve to fit into the core of a roll of material and surrounding said spindle at the inboard and outboard portions thereof,

bearing means between said sleeve and said inboard shaft portion,

said outboard portion being of smaller diameter than said inboard portion to provide a space between said sleeve and said outboard portion,

core engaging elements carried by such sleeve at said outboard portion movable radially inwardly and outwardly for engaging and disengaging the core,



an elastomer tube surrounding said outboard portion at said core engaging elements and disposed in said space,

an inner sleeve surrounding said spindle and disposed in said space and extending through said elastomer tube in sealing engagement with the longitudinal end portions thereof,

and expansion means for expanding said elastomer tube and thereby said elements.

3,908,927

FISHING REEL

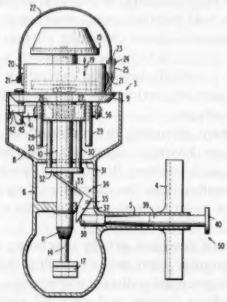
Claude Joseph Louison, 11 rue Cotatay, Le Chambon Feugerolles, Loire, France

Filed May 8, 1973, Ser. No. 358,444

Claims priority, application France, Nov. 5, 1971, 71.40698

Int. Cl.[2] A01K *89/01*

U.S. Cl. 242—84.21 A **3 Claims**



1. A fishing reel comprising protecting cup means, drum means rotatably mounted in said cup means, spool means mounted for reciprocating movement along the rotary axis of said drum means, drive means for rotating said drum means and reciprocating said spool means, pick-up means pivotally mounted on said drum means at diametrically opposed points, a thrust-ring connected to said drum means for rotation therewith and for axial movement relative thereto, connecting means operatively connecting said pick-up means to said thrust-ring, spring means normally biasing said ring away from said drum means to pivot said pick-up means to a position allowing a line to be wound on said spool means, actuator means for selectively shifting said ring against said spring means to pivot said pick-up means to a position allowing a line to be withdrawn from said spool and latch means for selectively engaging said ring when said ring is shifted axially against said spring means to maintain the pick-up means in the unwinding position; said latch means includes spring finger means secured to and extending radially outwardly from said thrust-ring and an axially extending hook member pivotally mounted on said drum means for movement between a first position wherein the hook member will engage said spring finger means to hold said ring against the force of said spring means and a second position wherein the hook member will be disposed out of the path of axial movement of said ring to prevent engagement therewith.

3,908,928

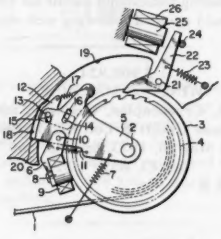
SEAT BELT DEVICES FOR AUTOMOBILES AND THE LIKE

Motohiro Okada, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 253,595, May 15, 1972, abandoned. This application Feb. 8, 1974, Ser. No. 440,811

Int. Cl.[2] A62B *35/00;* **B65H** *75/48*

U.S. Cl. 242—107.4 **4 Claims**



1. A seat belt for automobiles and the like and of the type including a spring-biased rotatable drum for automatically winding up the seat belt, comprising: a gear wheel formed on one side of said drum; a pawl member pivotally fastened to a seat structure for cooperative engagement with said gear wheel; spring means normally biasing said pawl member out of engagement with said gear wheel; means including electrical actuating means forming a closed electrical circuit upon buckling of said seat belt; a rocker arm rotatably mounted on said drum; drum locking means being supported on said rocker arm for making a fixed connection between said rocker arm and said drum responsive to said electrical actuating means upon closing of said electrical circuit, for locking said rocker arm in rotation with said drum, said rocker arm further including means thereon for pivotally moving said pawl into engagement with said gear wheel upon actuation of said drum locking means and subsequent withdrawal of said seat belt, thereby preventing said seat belt from being drawn out in excess of a predetermined length.

3,908,929

METHOD AND APPARATUS FOR REGULATING THE TENSION OF A MOVING THREADLIKE ELEMENT

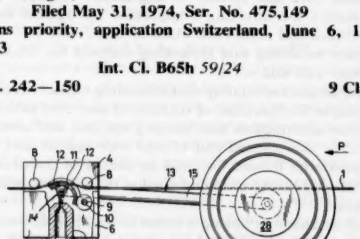
Vilem Stritzko, Strengelbach, Switzerland, assignor to Bleiche A.G., Zofingen, Switzerland

Filed May 31, 1974, Ser. No. 475,149

Claims priority, application Switzerland, June 6, 1973, 8168/73

Int. Cl. B65h *59/24*

U.S. Cl. 242—150 **9 Claims**



2. An arrangement for regulating the tension of a moving thread-like element, comprising wall means defining a re-

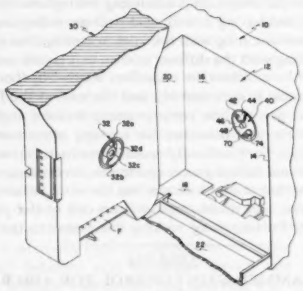
stricted space for passage of a moving thread-like element; nozzle means for blowing a stream of pressurized gaseous fluid into said space transversely of the path of movement of said element; a yieldable member mounted in said space intermediate said nozzle means and said path, said member contacting said element and being deflectable against the tension of the same by said stream of fluid; measuring means for measuring the backpressure resulting intermediate said member and said nozzle means from backing-up of said fluid; and braking means controlled by said measuring means and operative for braking said element with a force which is a function of and varies with the measured backpressure.

3,908,930

ADJUSTABLE DRIVE MECHANISM FOR A MOTION PICTURE CAMERA

Robert I. Gresens, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 4, 1974, Ser. No. 438,990
Int. Cl.² G03B *1/04*; **G11B** *15/32, 23/04*
U.S. Cl. 242—197 **10 Claims**



4. In a motion picture camera having drive means and adapted to receive either (1) a cartridge having means indicating that the cartridge is of a first type having a film advancing portion requiring application of a first driving force by the camera or (2) a cartridge having means indicating that the cartridge is of a second type having a film advancing portion requiring application of a second and greater driving force by the camera, the improvement comprising:

a. a friction clutch adjustable for selectively applying either the first driving force or the second driving force to the film advancing portion of a received cartridge, said friction clutch comprising:

i. a first member supported by the camera in a position to be rotatably driven by the drive means; and

ii. a second member adjustably and frictionally coupled to said first member for applying the first or the second driving force to the film advancing portion of the cartridge, said driving force being a function of the frictional force created between said first and second portions;

b. friction increasing means for adjusting said friction clutch to apply the first driving force to the film advancing portion of the cartridge when a first type of cartridge is received by the camera and to apply the second driving force to the film advancing portion of the cartridge when a second type of cartridge is received by the camera, said friction increasing means comprising:

i. sensing means for cooperating with the means of a cartridge indicating that the cartridge is of a first or second type, said sensing means being movable between

1. an extended condition, and

2. a depressed condition; and

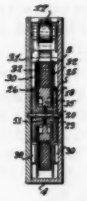
ii. pressure means coupled to said friction clutch for adjusting the driving force transmitted by said friction clutch responsive to said movement of said sensing means, said pressure means being movable (1) to a first condition when said sensing means is moved to said extended condition wherein said friction clutch is effective to supply the first driving force and (2) to a second condition when said sensing means is moved to said depressed condition whereby said sensing means increases the frictional force created between said first and second members of said clutch such that said friction clutch applies the second driving force to a cartridge.

3,908,931

TAPE AND FILM CARTRIDGE DRIVE MEANS

John O. Fundingsland, 1126 N. Sheridan, Colorado Springs, Colo. 80909

Filed Aug. 22, 1973, Ser. No. 390,389
Int. Cl.² G03B *1/04*; **G11B** *15/32, 23/04*
U.S. Cl. 242—199 **4 Claims**



1. A cartridge for the winding and storage of tape comprising:

a housing having sides;

a pair of spaced apart mutually parallel fixed spindles carried by one of the sides of the housing and perpendicular thereto;

a hub mounted for rotation on each of said spindles;

first drive means concentric with each of said spindles and fixedly attached to each of said hubs disposed and adapted to engage second drive means disposed exteriorly of the cartridge, said first drive means comprising,

a flange integral with the hub, the plane of which is perpendicular to the spindle, the periphery of said flange having means for driving engagement with said second drive means; and

a second hub concentric with the first hub and mounted for rotation therewith.

3,908,932

FABRIC REEL

James A. Popham, RR1 Delaware, London, Ontario, Canada

Filed Sept. 9, 1974, Ser. No. 504,368
Int. Cl.² B65H *75/06*
U.S. Cl. 242—222 **5 Claims**

1. A reel for web-like material comprising in combination: a rectangular central panel having a pair of parallel side edges and a pair of parallel end edges;

a pair of side wall panels foldably attached to said central panel one along each of said side edges and extending from the same surface of said central panel generally perpendicular thereto;

a pair of side top wall panels foldably attached one to each of said side wall panels along lines spaced from and parallel to said pair of side edges, said side top wall panels extending toward one another in a generally parallel relationship to said central panel and having terminating edges arranged in a spaced parallel relationship and on

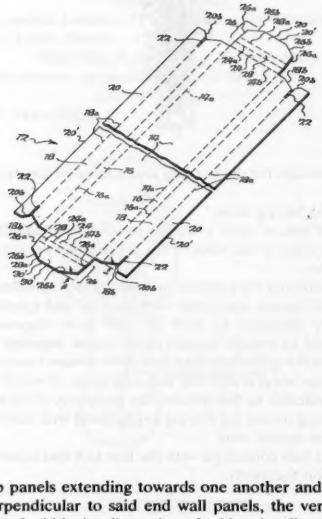
opposite sides of a central portion of said central panel disposed intermediate said side edges;

a pair of reinforcing panels foldably attached one to each of said side top wall panels along said terminating edges and extending downwardly into surface abutting engagement with said same surface adjacent said side edges whereby to cooperate with said side wall panels to form side wall assemblies of essentially triangular cross-sectional configuration;

an end opening slot disposed in alignment with and adjacent to opposite ends of each of said terminating edges and serving to separate common ends of said side top wall panels and said reinforcing panels;

a pair of end wall panels foldably attached to said central panel one along each of said end edges and extending from said same surface of said central panel generally perpendicular thereto;

a pair of composite end top wall panels foldably attached one to each of said end wall panels along lines spaced from and parallel to said end edges, said composite end



top panels extending towards one another and generally perpendicular to said end wall panels, the vertically directed widthwise dimension of said end wall panels being less than the vertical widthwise dimension of said side wall panels by an amount corresponding essentially to the thickness of said side top wall panels, each of said composite end top wall panels being inserted into an associated pair of said slots opening theretowards and lying essentially parallel to said central panel vertically intermediate said side top wall panels and said reinforcing panels, each of said composite end top wall panels being frictionally retained within said associated pair of said slots and characterized as including fold assist and locking panels foldably attached along a line spaced from and parallel to its line of attachment to an associated one of said end wall panels, the widthwise dimensions of associated ones of said end wall panels and said fold assisting panels and said locking panels being correlated whereby said locking panel may be maintained in essentially parallel relationship to said central panel during movement thereof inwardly of said slots into a seated position.

3,908,933

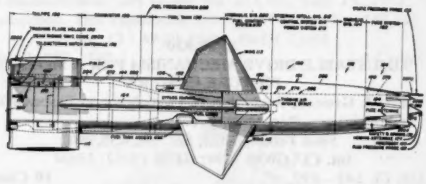
GUIDED MISSILE

Wilbur H. Goss, Silver Spring, Md.; Henry H. Porter; Richard B. Roberts, both of Washington, D.C.; Merle Antony Tuve, Chevy Chase, Md.; Jesse W. Beams, Charlottesville, Va., and Harner Selvidge, Detroit, Mich., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 26, 1956, Ser. No. 594,067

Int. Cl.[2] F42B *15/02*

U.S. Cl. 244—3.21 **25 Claims**



1. An aerial missile including, in combination, an airframe comprising a plurality of connected body assemblies having duct sections defining a duct extending throughout the length of the body and having a wall, said wall providing an inlet, a diffuser communicating with the inlet, a combustion chamber communicating with the diffuser and an exit nozzle communicating with the combustion chamber, a cowl lip connecting the forwardmost body assembly and the wall of the forwardmost duct section at their corresponding forward ends, wings on the airframe and mounted for rocking movement about their root axes, longitudinally spaced partitions surrounding the duct wall and defining a compartment, an explosive charge in the compartment and surrounding the duct, a fuze system for the charge, and means mounted on one of the partitions and operable for imparting rocking movement to the wings.

3,908,934

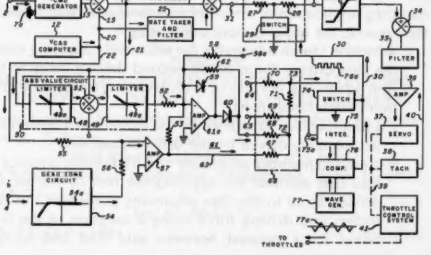
PROGRAMMED GAIN CONTROL FOR AIRCRAFT THROTTLE CONTROL SYSTEM

Robert W. Schloeman, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,003

Int. Cl.[2] B64C *13/18*

U.S. Cl. 244—77 D **10 Claims**



1. In a variable gain engine throttle control system for an airborne craft:

craft command speed signal generator means,

craft air speed signal generator means,

differential means responsive to said craft command speed signal generator means and to said craft air speed generator means for developing an error signal,

gain control signal generator means responsive to said error signal and to said craft air speed signal for providing an output summation signal of signals representative of said error signal and said craft air speed signal,

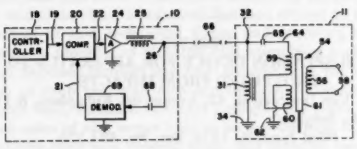
gain multiplier means in series relation with said differential means and responsive to said gain control signal generator means, and

engine throttle control means responsive to said gain multiplier means.

3,908,935
AIRCRAFT DUPLEX SYSTEM

Richard P. Heintz, Kalamazoo, Mich., assignor to Pneumo Dynamics Corporation, Boston, Mass.

Filed Apr. 19, 1974, Ser. No. 462,250
Int. Cl.² B64C *13/04*
U.S. Cl. 244—83 E **3 Claims**

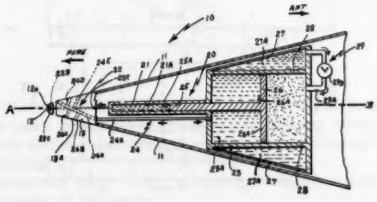


1. A system for interconnecting the various portions of an aircraft actuator, comprising means for generating a command signal proportional to the desired movement of a portion of the aircraft, means for comparing the command signal with a feedback signal indicative of actual movement of the portion of the aircraft and for developing an error signal occurring in a low frequency range, an inductor connected to receive the error signal and apply same to a first terminal located in the electronics bay of an aircraft, an electrohydraulic valve remotely located in a control station of the aircraft and connected to a second terminal in the control station, a feedback device for monitoring said electrohydraulic valve located in the control station, said feedback device adapted to provide a relatively high frequency output signal, a capacitor connected between said feedback device and the second terminal, a single wire connecting said first and second terminals, a demodulator in the electronics bay of the aircraft for converting the high frequency feedback signal to a signal compatible with the command signal, and a second capacitor connected between said demodulator and the first terminal for completion of the circuit.

3,908,936
MULTIPLE FLUID FLOW PROPORTIONING SYSTEM

Donald A. Durran, Manhattan Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 22, 1974, Ser. No. 516,933
Int. Cl.² B64C *1/38*
U.S. Cl. 244—117 A **3 Claims**



1. A multiple fluid flow proportioning system for use with a low angle reentry space vehicle of conical configuration, with said reentry vehicle having a longitudinal axis, a fore end, and an aft end, and with said reentry vehicle also having a nose and a skirt at the fore end, comprising;

a. a first cylindrical reservoir having a smaller diameter within said reentry vehicle and containing a fluid coolant for cooling said nose of said reentry vehicle;

b. means for directing the controlled flow of said fluid coolant from said first reservoir to said nose of said reentry vehicle;

c. a second cylindrical reservoir having a larger diameter within said reentry vehicle and containing a fluid coolant for cooling said skirt of said reentry vehicle, said second reservoir being coaxial with and spaced apart from the said first reservoir;

d. means for directing the controlled flow of said fluid coolant from said second reservoir to said skirt of said reentry vehicle;

e. a first piston movable through the first reservoir to expel coolant therefrom to the nose of the reentry vehicle;

f. a second piston movable through the second reservoir to expel coolant therefrom to the skirt of the reentry vehicle;

g. means rigidly interconnecting the first and second pistons for movement in unison;

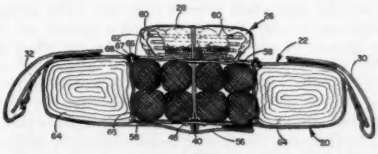
h. a source of pressurized gas; and,

i. controlled means admitting gas from said source to one side of the second piston to move said second piston through the second reservoir whereby coolant is simultaneously expelled at a low flow rate and at a high flow rate respectively from the first and second reservoirs.

3,908,937
PARACHUTE PACK

Daniel F. Poynter, North Quincy, Mass., assignor to Strong Enterprises, Inc., North Quincy, Mass.

Filed Oct. 31, 1973, Ser. No. 411,488
Int. Cl.² B64D *17/40*
U.S. Cl. 244—148 **17 Claims**



1. A container for a parachute canopy for release by an operator comprising:

a pack generally fashioned to enclose a main parachute canopy and associated lines;

a pilot chute for urging the canopy from said pack upon deployment of said pilot chute;

means for propelling said pilot chute away from said pack;

means for releasably securing said pilot chute against propulsion away from said pack in a position substantially external of said pack which position permits release of said pilot chute directly from the external position without obstruction;

a cover for said pilot chute;

means for securing said cover to said pilot chute whereby said cover travels with said pilot chute upon release of said pilot chute.

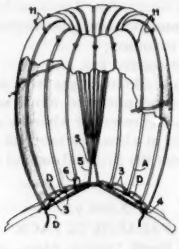
3,908,938
PARACHUTE

Marcel H. Pravaz, Clichy, France, assignor to Etudes et Fabrications Aeronautiques, Paris, France

Filed Apr. 17, 1973, Ser. No. 351,851
Claims priority, application France, Apr. 21, 1972, 72.14130
Int. Cl.² B64D *17/34*
U.S. Cl. 244—152 **7 Claims**

4. A parachute canopy having an inner part and an outer peripheral edge and comprising a parachute fabric portion

extending from said peripheral edge to said inner part, said inner part having a centre attachment point at the anex of said canopy, first tie means for throttling said fabric portion which tie means extend in and are connected to said fabric portion substantially in a transverse plane of the canopy and are capable of initially preventing to a major extent a fully opening of the canopy in the radial direction in said transverse plane when the canopy is in a first state corresponding to an initial stage of the opening of the canopy, second tie means extending downwardly from said centre attachment point to said first tie means and connecting said centre attachment point of said inner part of the canopy to said first tie means and capable of restraining, so long as said first tie means are operative in said preventing of full opening, said centre attachment point of said inner part from moving beyond a predetermined distance away from said plane to a position it will eventually occupy



when the canopy is fully opened, said first tie means being connected to said fabric portion in a region of said fabric portion intermediate said peripheral edge and said inner part of the canopy so that in said first state the canopy has a lower outer annular part which extends from said outer periphery upwardly and inwardly to said plane and is opened only to an extent allowed by said first tie means under the effect of air entering the canopy from below and an upper part which extends upwardly from said plane to an upper annular portion of the canopy and thereafter extends downwardly and inwardly from said upper annular portion to said inner part, and means for rendering said first tie means inoperative and consequently the second tie means inoperative in the course of the opening of the canopy whereby the canopy is unthrottled and said inner part is no longer restrained and the canopy is made free to open to its normal extent in a second stage.

3,908,939

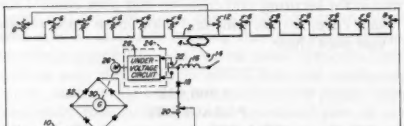
CRANE TROLLEY SPEED LIMITER

Ralph W. Sheffler, Ewing Twp., N.J., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 21, 1974, Ser. No. 444,428

Int. Cl.² B61L *3/18*

U.S. Cl. 246—182 R **3 Claims**



1. Apparatus for limiting the speed of a crane trolley alon g a crane runway comprising

a sectionalized control rail running the length of the crane runway,

a resistor connected between each pair of adjacent control rail sections,

a source of direct current power connected to energize the control rail thereby providing a reference voltage representative of a desired maximum allowable trolley speed for each control rail section,

a collector shoe mounted on said trolley and adapted to contact the control rail and transfer the reference voltage as the trolley moves along the length of the runway,

means for providing a voltage representative of the actual speed of the trolley and

means mounted on said trolley and connected to said collector shoe and said means for providing a voltage representative of the actual speed of the trolley and responsive to the voltage representative of the actual speed increasing to the level of the reference voltage for reducing the speed of the trolley.

3,908,940

CABLE-SUSPENSION DEVICE FOR APPARATUS TO BE PROTECTED FROM IMPACTS

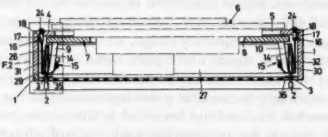
Pablo M. Van Der Stricht, 42, Avenue des Rubepines, B-1180 Brussels, Belgium

Filed June 26, 1974, Ser. No. 483,324

Claims priority, application Belgium, June 27, 1973, 801,491

Int. Cl.² A47B *9/02*

U.S. Cl. 248—18 **16 Claims**



1. Cable-suspension device for apparatus to be protected from impacts, said device being self-stabilizing with three-way movability, which comprises in combination a fixed stand and a movable frame, said movable frame supporting said apparatus and being suspended from said fixed stand by means of at least three cables each running in a zigzag configuration and having at least two substantially vertical sections, said movable frame having a depending foot for each suspension cable to which is made fast one end of the corresponding suspension cable.

3,908,941

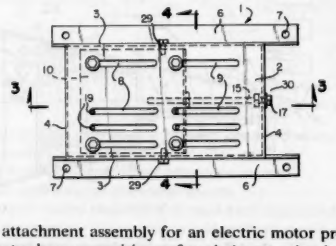
MOTOR ATTACHMENT ASSEMBLY

Thomas D. Bromley, and Marvin L. Stark, both of Anchorage, Ky., assignors to Dover Corporation, Louisville, Ky.

Filed Feb. 12, 1974, Ser. No. 441,849

Int. Cl.² F16M *11/04, 3/00*

U.S. Cl. 248—23 **2 Claims**



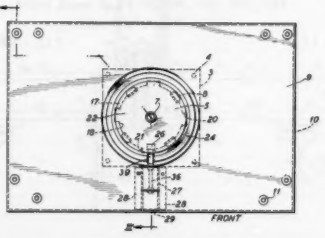
1. An attachment assembly for an electric motor provided with a motor base comprising, a foundation member having a raised planar top support plate provided with a plurality of parallel and axially aligned elongated slots therethrough, side walls depending from opposite sides of said support plate, at least one end wall depending from said support plate, an

interior longitudinally shiftable slide member having a planar integral slide plate disposed beneath said top support plate and including a plurality of holes therethrough at least two of which are vertically aligned with respective ones of said slots in said support plate, retaining means carried by the medial portion of each said side wall and extending beneath said support plate to support said slide plate immediately juxtaposed the undersurface of said support plate while allowing of relative longitudinal movement therebetween, said retaining means disposed clear of said slide member holes throughout the longitudinal shifting of said slide member, screw means axially fixed to the medial portion of said foundation member end wall and threadedly engaging said slide member to longitudinally displace said slide plate and holes relative said support plate and slots, a transverse depending flange at one end of said slide plate, a threaded fastener affixed to the medial portion of said slide plate flange and receiving said screw means, a plurality of elevated stud assemblies each having a stud disposed through one said slot and hole, the upper portion of each said stud disposed through an opening in said motor base, threaded fasteners engaging the lower portion of both sides of said motor base to secure the base in a position elevated from said support plate, and separate threaded fasteners engaging the lower portion of each said stud with one said separate fastener disposed above said support plate and another said separate fastener disposed beneath said slide plate for each said stud to rigidly clamp said integral slide plate to said support plate whereby, upon the release of either one of said fasteners engaging each of said stud lower portions said slide plate is unclamped from said support plate and rests upon said retaining means such that subsequent actuation of said screw means permits of longitudinal shifting of said integral slide plate with concurrent shifting of all said stud assemblies without interference between said stud assemblies and said retaining means.

3,908,942
MOUNTING MEANS FOR TELEVISION SETS AND THE LIKE

Glen R. Keith, and Ronald B. Thompson, both of Morton, Ill., assignors to Morton Metalcraft Co., Morton, Ill.

Filed Apr. 25, 1974, Ser. No. 464,035
Int. Cl.² A47G *29/00*
U.S. Cl. 248—158 **7 Claims**



1. Mounting means for removably connecting an article of some value in upright position on a supporting means in a manner to discourage theft of the article, said mounting means comprising:

a mounting plate having means for securing it onto the bottom of the article;

said mounting plate having a central depressed mounting portion provided with a downwardly facing bearing area;

a complementary supporting bearing plate having means for securing it fixedly to the supporting means and provided with an upwardly facing bearing area with which said downwardly facing bearing area is in article supporting bearing relation;

said bearing plate upwardly facing area having a series of circumferentially spaced upwardly extending rigid angular connecting flanges provided with overhanging interlock portions;

said mounting portion having a plurality of circumferentially spaced slots and said connecting flanges extending upwardly through said slots and with said interlock portions in interlocking overlying relation to underlying areas of said mounting portion in response to limited relative rotary interlocking movement of said plates; and

means for releasably locking said plates against relative rotary unlocking movement.

3,908,943
SECTIONAL SUPPORT MEMBER

Brian Charles Bannister, North Mymms, England, assignor to Marler Haley Expo Systems Limited, Barnet, England

Filed Oct. 15, 1973, Ser. No. 406,450
Claims priority, application United Kingdom, Oct. 16, 1972, 47614/72
Int. Cl.² A47F *5/00*
U.S. Cl. 248—159 **17 Claims**

1. A support member for a display system, comprising:

a plurality of elongate body members, each body member having a central opening at each end and a regular surface profile in plan, said profile including a plurality of arms each of which includes receiving means in which display members of said display system may be received and supported; and

connector means including elongate spigot means adapted to be engaged with a force fit in a said central opening of one of said body members, said connector means also including catch means intermediate the length thereof, said catch means having a profile corresponding with that of the body members and being rotatable relative to said spigot means between one position in which display members can be received in and dismounted from said arms and a second position in which said display members are secured in position in said arms whereby the display members cannot be removed from the arms.

3,908,944
DRAWING TABLE WITH DRAWING BOARD RELIEVED BY GAS SPRING

Bengt Anders Bjork, Eskilstuna, Sweden, assignor to Domkraft AB Nike, Eskilstune, Sweden

Continuation of Ser. No. 312,237, Dec. 4, 1972, abandoned. This application Aug. 6, 1974, Ser. No. 495,180
Int. Cl.² A47B *27/16*
U.S. Cl. 248—162 **2 Claims**

1. A drawing table with a support device for the drawing board comprising in combination

a. a telescopic column means,

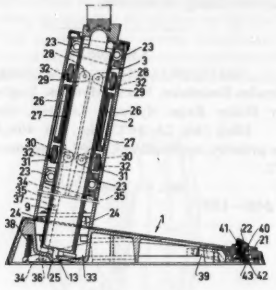
b. brake means for rigidly interlocking said telescopic column means,

c. a gas spring located within the telescopic column means which gas spring is preloaded with a pressure in excess of

the pressure required to support the weight of the drawing board and its associated parts,

d. a valve associated with said gas spring which is readily accessible so as to permit the introduction to and the removal of gas from said gas spring while said gas spring is in its mounted state within said telescopic column means,

e. said column means comprising a column connected to a base plate and a tube movable within the column and connected with the drawing board proper, characterized



in that it comprises a pair of brake shoes located between the column and the tube and acting in the direction towards each other and the tube, which shoes for locking the tube are adapted to move downwardly and inwardly towards the tube so that a self-locking action is effected against further movement of the tube downwards in relation to the column, whereby, after the entire drawing table and the equipment that is to be used thereon have been assembled, the gas which is in excess of that required to support the drawing board and its equipment at the desired height can be discharged.

3,908,945

PORTABLE CAMERA MOUNTING APPARATUS

Herbert D. Shapiro, 17106 Richard, Southfield, Mich. 48075, and George A. Bondi, 34466 W. Nine Mile Rd., Farmington, Mich. 48024

Filed Feb. 21, 1974, Ser. No. 444,398

Int. Cl.[2] F16M *11/32, 11/14*

U.S. Cl. 248—165 **9 Claims**

1. A portable camera mounting apparatus adjustable from a camera mounting position to a storage position, said apparatus comprising:

an elongated tubular body member comprising a sleeve member and a tubular core member having a hollow interior and being telescopically extendable relative to said sleeve member, said body member having a proximal end and a distal end;

stop means to limit the amount of extension of said core member relative to said sleeve member;

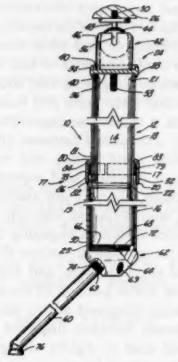
locking means to selectively retain said core member relative to said sleeve member in an extended position, in a retracted position and in intermediate positions;

a camera mount reversibly secured to said proximal end and for extending outwardly from said proximal end in said camera mounting position and for extending inwardly into said interior in said storage position, said camera mount comprising:

a collet threadable on the peripheral surface of said core member at the end thereof corresponding to said proximal end,

a transversely disposed partition in said collet, pivot mount means for supporting and orienting a camera, and means for removably connecting said pivot mount means to one side of said partition in said collet;

a leg mount removably secured to said distal end, said leg mount having a side provided with a first plurality of peripherally spaced angularly disposed leg receiving cavities and another side provided with a second plurality of spaced parallel leg receiving cavities; and



a plurality of legs received into said first plurality of cavities in a manner to provide a support for said body member when in a vertical position and received into said second plurality of cavities for storage in said interior.

3,908,946

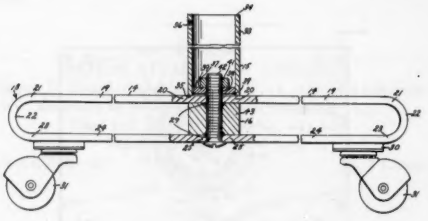
CHAIR BASE CONSTRUCTION

Robert F. George, Crugers, N.Y., and Peter Lawrence, Lombard, Ill., assignors to Simone P. Lawrence, New York, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,387

Int. Cl. F16m *11/20, 13/00*

U.S. Cl. 248—188.7 **11 Claims**



1. A chair base for swivel chairs and similar articles of furniture comprising: a plurality of generally horizontally disposed leg elements with each member having substantially free side edges, each including an upper planar member and a lower planar member in spaced parallel relation thereto, each of said upper and lower members being interconnected at the outer ends thereof, and at second inner ends thereof, said inner ends thereof being juxtaposed with those of other leg elements in radial relation relative to each other at a centrally disposed point; a single integrating means interconnecting said inner ends of said legs, such that the inner ends of said upper planar members are substantially coplanar and the inner ends of said lower planar members are coplanar, and an upwardly facing socket element supported by said inner ends of said leg elements.

3,908,947
STANDARD FOR A SIGN

William E. Bledsoe, Jr., Milwaukee, Wis., assignor to Bledsoe Corporation, Menomonee Falls, Wis.

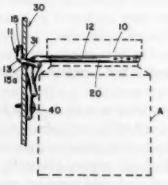
Continuation-in-part of Ser. No. 351,899, April 17, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,631
Int. Cl.[2] A01G 27/00
U.S. Cl. 248—188.7 3 Claims

1. A standard for a sign comprising a plurality of support legs and a base having a lower edge and a top wall with upper and lower surfaces and an annular wall with inner and outer spaced surfaces and including a barrel extending from said base top wall and first and second groups of slots in said standard for receiving said supporting legs, said slots in said first group being defined by wall portions in said annular wall open to the lower surface of said top wall, said base including a downwardly tapered frusto-conical shaped projection, said projection having an outer projection surface spaced from said annular wall inner surface and wherein said second group of slots is defined by wall portions in said projection in radial alignment with said slots in said annular wall, and wherein said projection has an end wall having an upwardly convex inner surface engageable with the inner ends of said legs to cam said legs into engagement with said lower surface of said top wall and said lower surface to said first slots upon insertion of the legs in the slots to secure said legs in said base.

3,908,948
ADJUSTABLE CONTAINER SUPPORT

Ralph W. Hawthorne, 2238 Gun Lake Rd., Hastings, Mich. 49058

Filed June 7, 1974, Ser. No. 477,305
Int. Cl.[2] A47F 5/00
U.S. Cl. 248—223 11 Claims

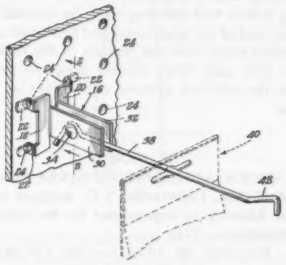


11. A bracket adapted to be secured to a wall for detachably supporting a container, said bracket comprising: a first element and a second element; said first element at its upper end having means for anchoring it to a wall, said first element also having a depending lower portion, the bottom end thereof being adapted to seat against a wall; said second element having a pair of forwardly extending, horizontally spaced article clamping arms integrally joined by a depending portion; said second element at the juncture between said arms and said depending portion extending behind said first element, and the bottom of said depending portion being seated against and secured to the forward face of said first element adjacent the lower end of said lower portion thereof, whereby loads imposed on said second element are transmitted to said first element by compression where the elements bear against each other.

3,908,949
ARTICLE SUPPORT BRACKET

Charles O. Larson, Sterling, Ill., assignor to Chas. O. Larson Co., Sterling, Ill.

Division of Ser. No. 332,902, Feb. 15, 1973, Pat. No. 3,853,293. This application Aug. 5, 1974, Ser. No. 494,526
Int. Cl.[2] A47H 1/10; E06B 7/28; A47F 5/00
U.S. Cl. 248—223 1 Claim

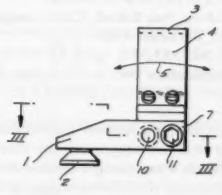


1. An article support device for use with apertured panels such as PEGBOARDS and the like including a plate bracket member for engagement with the outer surface of a vertical disposed apertured panel, means associated with said plate member for interlocking with an aperture of said panel for securing said plate in flush engagement therewith, wherein said means associated with said plate bracket member is a bent rod having transversely displaced, diametrically opposed extentions, one of said extensions being arranged to fit through said plate member and an aperture of said panel and the other of said extension engaging the front of said plate member firmly to hold said plate member in position, elongate article support means adapted to project outwardly from said plate member when said plate member is secured to said apertured panel, and means for clampingly engaging said elongate article support means to secure said support means in a predetermined article accommodating position.

3,908,950
MOUNT FOR A TELESCOPIC SIGHT

Ernst Apel, Wurzburg, Germany, assignor to Ernst Apel, Feinmechanische Erzeugnisse, Gerbrunn, Germany

Filed Feb. 26, 1974, Ser. No. 446,022
Claims priority, application Germany, Mar. 1, 1973, 7307722[U]
Int. Cl.[2] F41G 1/38
U.S. Cl. 248—291 2 Claims



1. A mount for a telescopic sight, such as a rifle scope, comprising a first component adapted to be mounted on a firearm; a second component adapted to hold a telescopic sight and extending upwardly of said first component, said

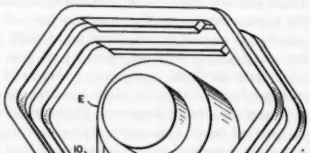
components having respective first and second portions formed with aligned bores which are dimensioned to admit of slight changes in the vertical orientation of said second component relative to said first component, one of said portions being bifurcated and having two arms provided with two parallel sets each composed of two axially aligned first bores in the respective arms, one bore of each set being tapped, the other of said portions being located between said arms and having two second bores each of which is aligned with one set of first bores, one of said second bores being tapped and the other second bore having an inner diameter which is larger than that of the aligned first bores; and screw-threaded means provided in said bores for connecting said first and second portions rigidly with one another, said screw-threaded means comprising a first bolt meshing with the threads in said one second bore and of the aligned tapped first bore, and a second bolt extending freely with the threads of the first bore which is aligned with said other second bore, so as to prevent changes in the selected relative orientation of said second component.

3,908,951

SHOCK ATTENUATING STRUCTURE

Kenneth W. Goben, Taylorsville, N.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 20, 1973, Ser. No. 426,783
Int. Cl.[2] F16F *7/12*
U.S. Cl. 248—358 R **1 Claim**



1. An akimbo shaped shock attenuating support structure for a device mounted in the interior area of said support structure comprising a unitary member having a rectangular cross section and reinforcing means for preventing the top member of said akimbo shaped support from deforming during shock loads which would be damaging to said device, said support structure being substantially rigid for shock loads below a predetermined magnitude and being plastic for shock loads above said predetermined magnitude.

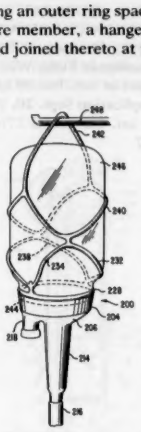
3,908,952

CONTAINER SUPPORT

Raymond D. Von Alven, San Rafael, Calif., assignor to Cutter Laboratories Inc., Berkeley, Calif.

Division of Ser. No. 353,373, April 23, 1973, Pat. No. 3,865,339. This application Dec. 2, 1974, Ser. No. 528,731
Int. Cl.[2] A61B *19/00*; **A47G** *29/02*; **B65D** *23/10*; **A61B** *19/00*
U.S. Cl. 248—360 **9 Claims**

1. A combination cap and support for enclosing the open end of a container and for supporting the container in the administration of fluids, comprising a closure member having a side wall with means for detachably engaging the neck of a container and an end wall integral with the side wall, a drip tube surrounding an opening in the end wall and projecting outwardly therefrom, a drip chamber connected for communication with the drip tube, and an air inlet means in the end wall and adjacent to the drip chamber; and flexible support means integral with a periphery of the closure member, the support means including an outer ring spaced outboard of the periphery of the closure member, a hanger spaced outwardly from the outer ring and joined thereto at positions which are



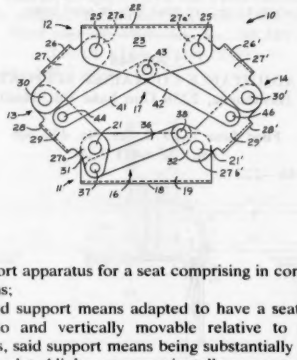
at least halfway around the outer ring; and extendible segment means connecting the periphery of the closure to the outer ring, the extendible segment means including at least two extendible segments.

3,908,953

SUPPORT APPARATUS FOR A SEAT

Herscheal W. Miller, 432 Fairmount St., Davenport, Iowa 52802

Filed Dec. 7, 1973, Ser. No. 422,659
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—421 **4 Claims**



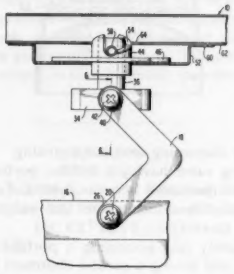
1. Support apparatus for a seat comprising in combination:
base means;
U-shaped support means adapted to have a seat attached thereto and vertically movable relative to said base means, said support means being substantially rigid;
first articulated linkage means pivotally connected between said base means and said support means;
second articulated linkage means pivotally connected between said base means and said support means;
strap means pivotally connecting said first means and said second means for maintaining said first and second means in predetermined angularly related positions during vertical movement of said support means; and
link means including first and second links only, each link pivotally connected at one end directly to a said articulated means and at an opposite end directly to said support means, said opposite pivotal connection being horizontally immovable and operable in conjunction with said first and second means to maintain the pivotal connection of said link means with said support means in a vertical plane during movement of said support means.

3,908,954

TELEPHONE DIRECTORY BINDER SUPPORT AND STORAGE APPARATUS

Walter E. Nix, Gainesville, Ga., assignor to Gladwin Industries, Inc., Gainesville, Ga.

Filed Mar. 28, 1974, Ser. No. 455,815
Int. Cl.[2] A47B 97/04
U.S. Cl. 248—447 3 Claims



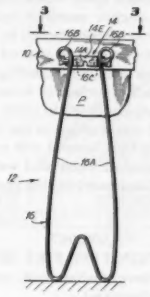
1. In a telephone directory holding and positioning apparatus of the type including a binding having a rigid back and hinge means connected to said rigid back for supporting the directory and binding for movement in a vertical plane extending substantially perpendicular to a longitudinal edge of a shelf between a storage position below and a use position above the shelf, and mounting and storage means for moving the directory and binding from said vertical plane to a storage position beneath the shelf, the improvement wherein said mounting and storage means comprises, in combination, a support bracket including a tubular sleeve having its axis extending in a generally vertical direction rigidly mounted beneath said shelf and spaced from said longitudinal edge, fixed cam means on said tubular sleeve and having at least one upwardly directed and upwardly spiraling cam surface thereon, a hanger assembly operably connected to said hinge means and said mounting bracket, said hanger assembly including a cylindrical shaft journaled in said sleeve and carrying cam follower means engaging said at least one cam surface and supporting said hinge means, said binding, and the directory thereon while permitting relative rotation between said hanger and said mounting bracket about a generally vertical axis, said cam means and said cam follower means cooperating to raise the structure supported thereon upon forced rotation of said binding in one direction from said storage position and to automatically rotate the structure in the opposite direction by action of gravity on the supported structure upon release thereof following such forced rotation to return the structure to said storage position, said hinge means including angle bracket means having one end pivotally connected to the rigid back of said binder substantially at the transverse centerline thereof and its other end pivotally connected to said cylindrical shaft with the pivotal axes of said angle bracket being generally parallel, said cam surfaces and said cam follower means being arranged so as to position the directory, binding and hanger means beneath said shelf with said binding extending generally parallel to said longitudinal shelf edge when said directory is in said storage position, said angle bracket projecting outwardly and upwardly around said longitudinal edge when said directory is in said use position.

3,908,955

CONVERTIBLE FRAME SUPPORT

Jean Frechtman, New York, N.Y., assignor to Jeanmarie Gallery, Inc., New York, N.Y.

Filed July 22, 1974, Ser. No. 490,898
Int. Cl.[2] A47F 7/14
U.S. Cl. 248—470 8 Claims



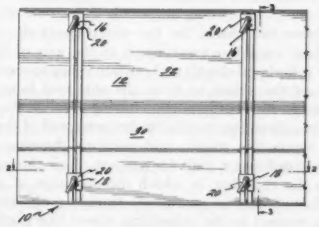
1. A device supporting an article having a frame comprising a stand element supporting said article in a first display mode, said stand including a pair of arms formed of resilient material and having a lower rest portion and an upper attachment portion, and a hanger element for supporting said article in a second display mode independently of said stand element and in said first display mode in conjunction with said stand element attached to said article and, said hanger element including coupling means for receiving said attachment portion of said stand element in said first display mode, wherein said upper attachment portion of said stand includes a pair of looped ends connected to respective ones of said arms and formed with opposed leg members, and wherein said coupling means of said hanger element includes a pair of segments located in planes transverse to the plane of said article and each transverse segment having an aperture corresponding to each of said leg members, each of said apertures receiving one of said leg members in a snug fitting relationship whereby said stand is pivotable away from said article until said looped ends contact said article to restrain further movement of said stand away from said article to thereby define said first display mode with said lower rest portion of said stand in contact with a substantially horizontal support surface.

3,908,956

CONCRETE POURING FORM PANEL

Harris Gordon Gates, Denver, Colo., assignor to Gates & Sons, Inc., Denver, Colo.

Filed Feb. 11, 1971, Ser. No. 114,622
Int. Cl.[2] E04G 11/08
U.S. Cl. 249—40 6 Claims



1. The free-standing form for poured concrete wall structures which comprises:

a pair of upstanding panels cooperating with the support therefor to define an open-topped cavity adapted to receive and retain wet concrete, at least one of said panels having an inwardly-extending overhanging portion;

upper and lower rows of transverse tie members arranged in longitudinally-spaced relation interconnecting the panels and adapted to maintain a fixed spaced relation therebetween, said lower row of tie members being spaced above the supporting surface upon which the panels rest; and,

means defining an anchor member suspended from the panels into the cavity therebetween in position to receive a portion of the wet concrete poured into the open top thereof, said anchor member including a horizontally-disposed upwardly-facing surface of substantial width defining a supporting area adapted to carry a sufficient weight of concrete which when added to the weight of the pouring form assembly thus formed will counterbalance any lifting forces generated when said wet concrete presses upwardly against said overhanging portion.

3,908,957

IONIZATION-TYPE FIRE SENSOR

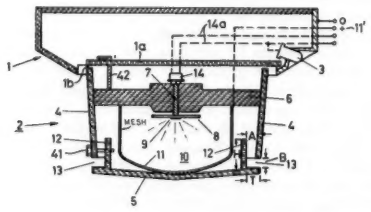
Klaus Schütt, Zollikerberg, Switzerland, assignor to Cerberus AG, Mannedorf, Switzerland

Filed Apr. 4, 1974, Ser. No. 457,841

Claims priority, application Switzerland, Apr. 17, 1973, 5519/73

Int. Cl.² G01T *1/18;* **G08B** *21/00*

U.S. Cl. 250—384 **17 Claims**



1. Ionization-type fire sensor having a socket (**1, 25**), an ion source (**9**) an inner and an outer electrode (**8, 23; 11, 24**), the outer electrode being located and shaped to define an ionization chamber in which ion current between said electrodes, upon application of an electric field, changes upon presence of fire or smoke aerosols within the chamber, wherein

the outer electrode comprises an essentiall continuous, air-pervious grid or mesh (**11; 24**), shaped to at least partly surround the inner electrode to prevent mechanical access to the inner electrode (**8, 23**) and hence accidental contact with the inner electrode; and

a housing coupled to said socket surrounding the electrodes and in part spaced therefrom, and comprising at least two portions (**4, 5; 21, 27**), said portions being separated from each other by an essentially continuous ring-shaped slit, one portion being essentially cylindrical and forming a sleeve-like shield for the outer electrode, the other portion extending transversely to the axis of the sleeve-like cylindrical shield, said portion being spaced from the end of the shield to form the slit, said housing being formed with a baffle portion having a wall portion extending in a direction parallel to the inner wall of the cylindrical sleeve-like shield, said portions thereby, and conjointly defining a path for passage of air through the slit into the chamber, in which the direction of air flow is deflected from an essentially straight path diametrically with respect to the cylindrical sleeve-like portion to essentially tangential direction with respect to said grid, or mesh electrode (**11, 24**) and in which at least one of said portions is removable from the socket.

3,908,958

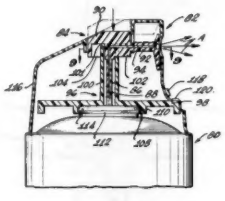
SAFETY DISPENSING DEVICE

Robert P. Linkletter, 875 Comstock Ave., Los Angeles, Calif. 90024

Division of Ser. No. 157,326, June 28, 1971, Pat. No. 3,828,981. This application Apr. 30, 1974, Ser. No. 465,606

Int. Cl.² F16K *35/00;* **B67B** *5/00*

U.S. Cl. 251—95 **8 Claims**



1. A safety dispensing device comprising:

a dispensing valve having a tubular portion mounted for limited reciprocation between open and closed positions; a first abutment formed on said valve and extending laterally thereof;

a rotary safety ring encircling a portion of said tubular portion, and having a second abutment formed thereon which engages said first abutment on said valve and holds said valve in said closed position;

and means on said ring concealed from view when said valve is in said closed position for permitting disengagement of said abutments from each other only when said ring is in one preselected rotary position relative to said valve, thereby to release said valve for movement to said open position.

3,908,959

DEVICE FOR CONTROLLING FLUID FLOW

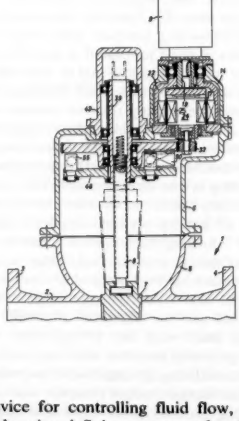
Hans E. Fichtner, Krefeld, Germany, assignor to Franz Klaus Union Armaturen Pumpen, Bochum, Germany

Filed Dec. 26, 1973, Ser. No. 427,163

Claims priority, application Germany, Dec. 22, 1972, 2263058

Int. Cl.² F16K *31/10, 31/06, 31/04*

U.S. Cl. 251—133 **16 Claims**



1. In a device for controlling fluid flow, a combination comprising a housing defining a passage for the flow of fluid between an inlet and an outlet and an internal chamber; fluid flow control means including at least one valve seat provided

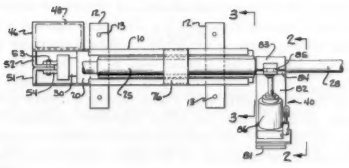
in said passage intermediate said inlet and said outlet and a valve body having at least one sealing surfac and mounted in said housing for displacement in a path between an open position and a closing position in which said sealing surface engages said valve seat for obstructing the flow of fluid through said passage; compartmentalizing means dividing said chamber into a first and a second compartment which are hermetically sealed with respect to one another and including a receptacle offset from said path; first drive means for effecting the displacement of said valve body along said path and located in said first compartment, said first drive means including a magnetic member mounted in said receptacle for displacement with respect thereto offset from said path; and second drive means for actuating said first drive means and located in said second compartment, said second drive means including magnetic means located adjacent said receptacle and operative for generating a magnetic field penetrating said receptacle and acting on said magnetic member so as to displace the same.

3,908,960

PIPE JACK

William E. Bagley, 2806 S. 4th St., Rockford, Ill. 61109

Filed June 10, 1974, Ser. No. 477,863
Int. Cl.[2] E21B *9/00*
U.S. Cl. 254—29 R **5 Claims**



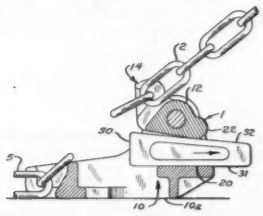
1. A pipe jack comprising: a tubular body having a cross-section generally in the form of a square tube with upright sides, and front and rear ends; the tubular body being open at the front end and having an elongate slot in its top extending rearwardly a preselected distance from the front end; a carrier mounted in the tubular body between the sides and below the top thereof and having an inverted U-shaped cross-section the legs of which lie closely adjacent the upright sides of the tubular body; the tubular body having inwardly projecting flanges at its top which overlie a portion of the top of the carrier and define the elongate slot; the carrier being slidable between a retracted position and an extended position where it extends through the open front end of the tubular body; a sleeve for receiving a length of pipe; the sleeve having an inner surface in the shape of a right circular cylinder the axis of which is parallel to the slot; the sleeve having a length several times its inside diameter; means on the carrier and extending through the elongate slot of the tubular body for removably mounting the sleeve on the carrier; a cylinder disposed entirely within the tubular body and between the legs of the carrier, and having a piston and a piston rod; means for attaching the cylinder to the tubular body; a bracket depending from the underside of the carrier for attaching the piston rod to the carrier with the axis of the piston rod parallel to the axis of the sleeve; means for selectively feeding fluid under pressure to the cylinder to move the piston and piston rod and thereby move the carrier relative to the tubular body; gripping means for gripping the pipe adjacent the sleeve and including: first and second arcuate members substantially surrounding the pipe, means hingedly connecting said arcuate members, and fluid operated means for applying force to said arcuate members to clamp the pipe between them; and said arcuate members providing a surface facing the sleeve for engagement thereby, whereby the pipe is jacked as the carrier is moved.

3,908,961

WEDGE ANCHORING DEVICE

John R. Hicks, Milwaukee, Wis., assignor to Applied Power, Inc., Milwaukee, Wis.

Continuation of Ser. No. 345,103, March 26, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,376
Int. Cl.[2] E02D *5/80*
U.S. Cl. 254—51 **5 Claims**



1. An anchoring device for anchoring a portion of an elongated element coupled to an object comprising

body means adapted to be anchored to a support surface,

said body means including element coupling means for selective coupling to a portion of an elongated element connected to a object,

said coupling means being mounted on said body means for relative motion thereto,

actuating means being selectively positionable in the body means for movement relative to the element coupling means,

said element coupling means including means responsive to movement of the actuating means to effect motion thereof in a selected direction to reduce slack of said elongated element,

the coupling means is pivotally mounted on the body means on a pivot axis,

the coupling means includes a retention means mounted in spaced relationship to the pivot axis of the coupling means to contact a portion of the elongated element,

said means responsive to the actuating means is positioned on the coupling means in spaced relationship to the pivot axis,

the actuating means includes an element being movable relative to the pivot axis to effect selective pivotal movement of the coupling means,

the actuating means is a wedge element, and

the body means includes a support surface slidably supporting the wedge element adjacent the coupling element.

3,908,962

METHOD FOR STRINGING POWER LINES

Arthur W. Ross, 94 Brimbal Ave., Beverly, Mass. 01915

Filed Sept. 3, 1974, Ser. No. 503,040
Int. Cl.[2] E21C *29/16*
U.S. Cl. 254—134.3 R **6 Claims**

1. A method of installing a power distribution line having a plurality of individual wires including a supporting wire installed between existing poles and wherein said wires are finally supported from said supporting wire by means of an insulating spacer, said method comprising the steps of;

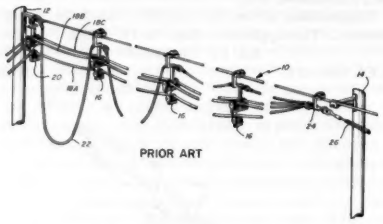
providing a support member,

installing the support member at a fixed position at the beginning of a run.

passing a plurality of side by side wires through the support member,

providing means for pulling in unison the plurality of wires, providing a pulley means which is hung from the supporting wire and includes means for receiving the spacer,

hanging the spacer from the pulley means with the wires being supported by the spacer,



hanging further spacers and pulley means from the supporting wire at predetermined distances along the wires as said wires are pulled,

and after the run has been completed removing the pulley means and hanging the spacers from the supporting wire.

3,908,963

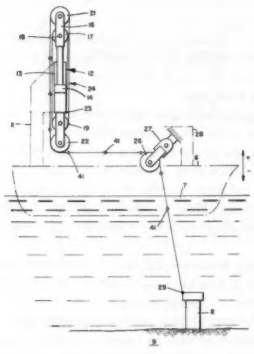
TENSIONER CONSTRUCTION

H. John Bates, Danville; Albert Louie, San Leandro, and John F. Gee, Oakland, all of Calif., assignors to The Rucker Company, Oakland, Calif.

Filed Sept. 30, 1974, Ser. No. 510,364

Int. Cl.[2] B66D *3/08*

U.S. Cl. 254—172 **6 Claims**



1. In a tensioner construction a pulley mounted on said tensioner for rotation about an axis and having a circular-cylindrical surface concentric with said axis, a first chain length adapted to contact said surface and including a plurality of individual first links arranged side-by-side and interspersed with other first links arranged end-to-end, first pins parallel to said axis connecting said first links, a first body having first fingers interspersed between the ends of some of said first links, a first body pin parallel to said axis and connecting said first fingers and said ends of said first links, a spherical head, means connecting said head and said first body with the center of said head on the side of said first pin opposite said first links, a second chain length adapted to contact said surface and including a plurality of individual second links arranged side-by-side and interspersed with other second links arranged end-to-end, second pins parallel to said axis connecting said second links, a second body having fingers interspersed between the ends of some of said second links, a second body pin parallel to said second pins and connecting said second fingers and said ends of some of said second links, a spherical socket encompassing and rotatable on said head, and means connecting said socket and said second body with the center of said socket on the side of said second pin opposite said second links.

3,908,964

ELECTRIC FENCE

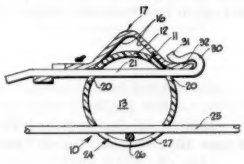
Gordon Francis Leiblich, Kimba, South Australia, Australia (5641)

Filed Oct. 19, 1973, Ser. No. 407,882

Claims priority, application Australia, Oct. 24, 1972, 0942/72

Int. Cl.[2] A01K *3/00;* **H01B** *17/16*

U.S. Cl. 256—10 **4 Claims**



1. An electric fence insulator assembly comprising an insulator formed from material having high electrical resistivity and having a hollow tubular shape, an abutment face on one side of the insulator arranged for abutment against a surface of a supporting post; a securing member aperture passing transversely through the tubular wall at two localities spaced from each other one on each side of said abutment face; a securing member comprising a wire having a return portion at one end thereof, the securing member passing entirely through the aperture, the member return portion engaging the post to secure the insulator to the post; a fence wire receiving slot extending into the hollow of the insulator from the side opposite the abutment face; and a retaining pin comprising a wire having a return portion at one end thereof extending through the hollow of the tubular insulator parallel to its longitudinal axis and against the inner wall surface, the pin wire engaging the insulator to define with the slot walls at its base fence wire retaining means.

3,908,965

COMPRESSED AIR OPERABLE INNER VIBRATOR FOR COMPACTING CONCRETE AND THE LIKE

Philipp Uebel, Munich, Germany, assignor to Wacker Werke KG, Munich, Germany

Filed July 2, 1973, Ser. No. 375,377

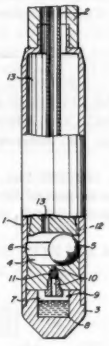
Claims priority, application Germany, July 6, 1972, 2233235

Int. Cl.[2] B28C *5/38*

U.S. Cl. 259—1 R **1 Claim**

1. A compressed air operable inner vibrator for compacting material, especially concrete, which includes in combination: housing means comprising an operating chamber with an endless path, and an unbalance body arranged in said operating chamber and operable to circulate along said endless path, said housing means having one end provided with inlet and outlet conduit means for respectively conveying compressed air into and releasing air from said operating chamber, said housing means also having another end remote from said one end and located in the vicinity of said operating chamber, closure cap means arranged at and closing said other end and the improvement therewith comprising means forming a lubricating system with said cap means including a reservoir for storing lubricant built into said cap means, and lubricant control means interposed between said operating chamber and said reservoir and operable automatically to bring about a transfer of lubricant from said reservoir to said operating

chamber in response to air pressure variations in said operating chamber, said lubricant control means including an air cushion in said reservoir and throttled conveying conduit



means between said reservoir and said operating chamber, and stopper means of hydroscopic air permeable material arranged in said conveying conduit means and adopted to be wetted by lubricant from said reservoir.

3,908,966

MIXING APPARATUS

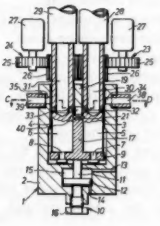
Heinrich Boden, Opladen, and Heinrich Ersfeld, Bergisch-Neukirchen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Filed Sept. 16, 1974, Ser. No. 506,666

Claims priority, application Germany, Sept. 27, 1973, 2348608

Int. Cl.² B01F *15/02, 3/08*

U.S. Cl. 259—4 **13 Claims**



1. An apparatus for mixing free-flowing liquid reaction components which react to form a synthetic resin or the like comprising a mixing head having a housing which surrounds a mixing chamber, an outlet opening from the chamber through the housing, at least two vertical lift slides having injection openings which communicate with the said chamber, a yoke coupling said lift slides together, means for driving the yoke, said yoke having an extension thereon disposed between the vertical lift slides which combines with a housing partition to form a gate, the injection openings of the vertical lift slides being covered by the housing partition and the opposite end faces of the housing partition and the yoke extension lying on top of one another in a rest position, while in a working position the mixing chamber is formed corresponding to the stroke height of the yoke between the opposite end faces of the housing partition and yoke extension, the outer surfaces of the vertical lift slides and a housing wall section.

3,908,967

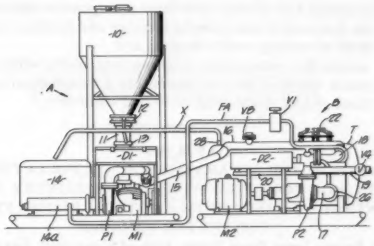
SLURRY DENSITY AVERAGING SYSTEM AND APPARATUS

Clyde H. Merritt, Corona, Calif., assignor to Byron Jackson Inc., Long Beach, Calif.

Filed May 9, 1974, Ser. No. 468,320

Int. Cl.² B28C *5/02, 5/46*

U.S. Cl. 259—153 **15 Claims**



15. A tank for use in a slurry mixing and averaging system comprising, a closed cylindrical tank body, a plurality of jet nozzles leading into said body and disposed at angles to cause tangential entry of slurry into said tank, a manifold connected with said jet nozzles, said tank having an outlet, and means for exhausting air from said tank and slurry from said tank when said tank is full, said tank having internal impingement plates disposed in the path of slurry exiting from said nozzles into said tank, and including means providing a scoop in said tank at said outlet, said scoop including an inner wall paralleling the wall of said tank, side walls joining said inner wall to said wall of said tank, said inner wall and said side walls defining an inlet to said scoop.

3,908,968

MOUNTING AND ROTATING ASSEMBLY FOR THE AXIALLY SHIFTABLE SHAFT OF AN INJECTION MOLDING MACHINE

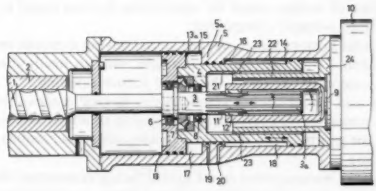
Friedrich Bernd Bielfeldt, Fischen, and Wolfgang Schaa, Munich, both of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Dec. 26, 1973, Ser. No. 428,353

Claims priority, application Germany, Dec. 30, 1972, 2264315

Int. Cl.² B29B *5/04*

U.S. Cl. 259—191 **8 Claims**



1. An injection-molding machine comprising in combination:

a. a plastifier housing, and at least one worm rotatably and axially shiftably received in said housing and having an axially extending shaft;

b. a cylinder member nondisplaceable with respect to said housing and receiving said shaft;

c. an annular piston member axially displaceable in said cylinder member and surrounding said shaft while being connected to said shaft for displacement of said worm in axial direction,

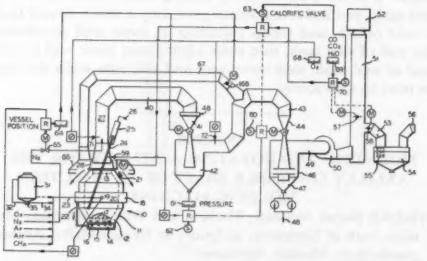
d. said cylinder member and said piston member defining a pressurizable compartment for the forward movement of said worm having a pair of oppositely effective annular surfaces arranged on said cylinder member and said piston member respectively,
e. said surface arranged on said piston member being provided as an annular flange on the end of said piston member facing in the direction of said worm, said surface arranged on said cylinder member being provided as an annular flange facing away from said worm;
f. an axially non displaceable drive arrangement attached to the free end of said cylinder member and having a further shaft extending axially therein; and
g. means for rotationally coupling said shafts within said piston member but for permitting a longitudinal movement of said shafts relative to one another.

3,908,969

METHOD AND APPARATUS FOR AIR POLLUTION CONTROL COMBINED WITH SAFE RECOVERY AND CONTROL OF GASES FROM A BOTTOM-BLOWN STEEL CONVERTER VESSEL

Kurt Baum; Joerg Peter Baum, both of Essen-Sud, Germany; Jai Kumar Pearce, and David Lee Schroeder, both of Pittsburgh, Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 209,953, Dec. 20, 1971, abandoned. This application Mar. 12, 1973, Ser. No. 340,302
Int. Cl.[2] C21C *5/40*
U.S. Cl. 266—17 **45 Claims**



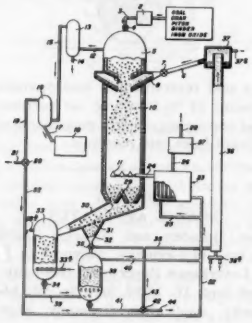
1. For use in a system for air pollution control and safe gas recovery and control of hot off-gases from a bottom blown oxygen steelmaking converter vessel utilizing injection of hydro-carbon fluid, as means to prevent bottom refractory deterioration along with process oxygen and other inert gases together with entrained finely divided materials beneath the surface of molten metal for converting ferrous metal to steel, the improvement comprising:
a. said bottom blown oxygen vessel having a mouth opening and a water-cooled hood means with an inside diameter essentially equal to the vessel mouth opening,
b. said water-cooled hood means having a movable skirt means advanceable and retractable to adjust and vary an air gap between said hood means and vessel mouth opening,
c. said water-cooled hood means being connected through a water-cooled stack means to a water-cooled duct means connected to a first venturi-scrubber for quenching hot gases and initial pre-cleaning,
d. said first venturi-scrubber being connected through ducting to a secondary wet venturi-scrubber for final cleaning,
e. said second venturi-scrubber means being provided with a fixed whirl vane separator for removing entrapped water particles from the gas stream, said gas stream being made to change direction and discharge tangentially to a duct leading to an exhaust fan,
f. said exhaust fan having an operating characteristic that provides an essentially constant pressure over a wide range of gas flow rates and a pressure outlet for discharging clean waste gases into a stack,
g. said waste gas stack having two outlets, a shut-off valve in each of said outlets, one of said stack outlets being provided with a torch to burn cleaned waste gases for discharge to the atmosphere, the other of said stack outlets being adapted for connection to a storage reservoir for gas storage.

3,908,970

METHOD AND APPARATUS FOR CARBONIZING AND DESULFURIZING COAL-IRON COMPACTS

Joseph Vlnaty, Aliquippa, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Division of Ser. No. 101,990, Dec. 28, 1970, Pat. No. 3,753,683, Continuation-in-part of Ser. No. 49,660, June 25, 1970, abandoned. This application Aug. 9, 1973, Ser. No. 387,017
Int. Cl.[2] F27B *1/08*
U.S. Cl. 266—20 **3 Claims**



1. An apparatus for producing low-sulfur content compacts of iron and carbonized coal from finely-divided sulfur-containing particles of coal and iron particles selected from iron powder and iron oxides comprising:
a. means for forming compacts of said iron particles and particles of sulfur-containing coals,
b. an enclosed reactor having:
1. means for charging compacts of said iron particles and sulfur-containing coal into one end and means for discharging carbonized and desulfurized compacts from the other end thereof,
2. means adjacent said one end for introducing a highly heated solid particulate material into the enclosed reactor and admixing the same with compacts therein to carbonize the compacts and form carbonization off-gases,
3. means adjacent said other end for introducing a hydrogen containing gas for countercurrent flow relative to the compacts in said enclosure whereby some of the hydrogen reacts with sulfur in the coal to form hydrogen sulfide in admixture with carbonization off-gases,
4. means adjacent said one end for exhausting said admixture of gases from the enclosure following contact with the compacts,
c. means adjacent the said other end for discharging the carbonizing and desulfurized compacts comprising means for separating the compacts and solid particulate material,
d. means for separating hydrogen sulfide from said admixture of gases, and
e. means for recycling a portion of carbonization off-gases, from which hydrogen sulfide has been separated, to said means for introducing a hydrogen-containing gas at the said other end of the reactor, including means for heating

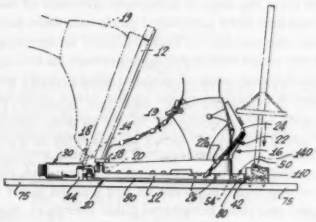
said portion of off-gases prior to recycling the said portion of off-gases to said means for introducing a hydrogen containing gas to the reactor, so that the heated portion of off-gases travels countercurrent to the heated solid particulate material and the compacts, said means for heating said portion of off-gases comprising a chamber into which, and through which, the still hot, solid particulate material passes after the discharge of the compacts and solid particulate material from the reactor and the separation of the compacts and the solid particulate material through which the portion of off-gases are circulated in contact with the solid particulate material to effect the heating of said portion of off-gases.

3,908,971

SKI BINDING

Steven F. Engel, 613 N. Rexford Drive, Beverly Hills, Calif. 90210

Filed Aug. 2, 1974, Ser. No. 493,869
Int. Cl.² A63C 9/08
U.S. Cl. 280—11.35 K **16 Claims**



1. A ski binding, adapted to be mounted on a ski blade and utilized for slope skiing, for ski touring and for ski mountaineering, with said ski blade, which comprises, in combination:
a sole plate;
boot retaining means affixed to said sole plate at the front and rear of said sole plate;
a walking plate, underlying said sole plate, and having frontal end and rearward end;
means for releasably fastening said sole plate to said walking plate;
a manually movable latching means for locking said rearward end of said walking plate to said ski blade, in a first locking position, and for disengaging said rearward end of said walking plate in a second rlease position; and
hinging means, mounted to the frontal end of said walking plate, for pivotally connecting said walking plate to said ski blade, whereby when said latching means is moved to said second release position, said walking plate is pivotally movable upwardly with respect to said ski blade, together with said sole plate and boot retainer means, about an axis transverse to said ski blade.

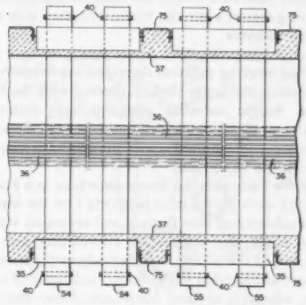
3,908,972

INSTALLATION FOR TREATMENT OF MINERALS ON A CONTINUOUS CIRCULAR GRILL

Edouard Bonnaure, Le Vesinet, France, assignor to Creusot-Loire Entreprises, Paris, France

Filed Sept. 5, 1973, Ser. No. 394,513
Claims priority, application France, Sept. 15, 1972, 72.32751
Int. Cl.² F27B 9/14, 9/16, 21/06
U.S. Cl. 266—20 **8 Claims**

1. A plant for heat-treatment of pelletised ores with gas flows comprising a continuous, circular rotary grid, a fixed base for said grid, a series of radial beams in the form of cradles supporting the bars of the grid, a loading zone, at least one treatment zone, a discharge zone and neutral zones for said grid, said grid passing, in each treatment zone, between an upper box and a lower box said boxes being fixed and fluid-tight, said radial grid-support beams extending beyond said boxes on either side, means for cooling said beams by internal water circulation, two circular, concentric rings rotating at the same angular velocity supporting said beams and mounted on said base, roller supports for said radial beams on said circular rings permitting free radial expansion of said beams and flexible, fabricated members flexing to allow tangential expansion of said radial beams connected to vertical, lateral sides of the ends of said beams adjacent said supports.

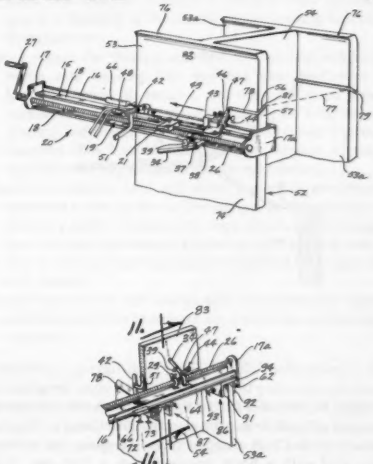


3,908,973

APPARATUS FOR SQUARING THE UPPER END OF A GROUND DRIVEN H-BEAM PILE

Desaix B. Martin, 2009 Searle St., Des Moines, Iowa 50317

Filed Jan. 29, 1974, Ser. No. 437,668
Int. Cl.² B23K 7/00
U.S. Cl. 266—23 K **4 Claims**



1. Apparatus for squaring the upper end of a ground driven H-beam pile having spaced side flanges and a connecting web, comprising:
a. an elongated frame structure,
b. a cutting torch assembly having a nozzle member with a flame end,
c. means releasably supporting the torch assembly on and longitudinally of said frame structure with the flame end

of said nozzle member spaced laterally outwardly from one side of said frame structure,

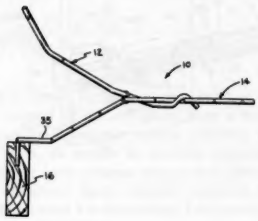
d. means movably mounting said supporting means on said frame structure for movement only longitudinally of said frame structure for either a vertically or horizontally extended working position of the frame structure,

e. manually operated means for longitudinally moving said mounting means when the frame structure is in a working position therefor,

f. means for mounting said frame structure in a vertically extended working position arranged transversely of a side flange along the outer surface thereof with the flame end of the nozzle member adjacent said outer surface whereby on said longitudinal movement of the supporting means a predetermined upper portion of a side flange is cut from the beam, and

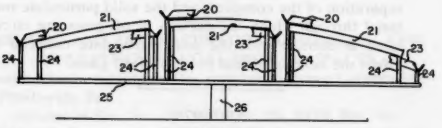
g. means for mounting the frame structure in a horizontally extended working position supported on the top edges of the foreshortened side flanges and arranged transversely of and along one side of the connecting web with the flame end of the nozzle member adjacent the one side of said web and located in the horizontal plane of said upper edges, whereby on said longitudinal movement of the supporting means a predetermined upper portion of the web, corresponding to said upper predetermined portions of the side flanges, is cut from the beam member.

3,908,974
SEAT SPRING WITH EXTENDER SPRING
Neville L. Riddle, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.
Filed May 16, 1974, Ser. No. 470,368
Int. Cl. F16f *3/02*
U.S. Cl. 267—102 **5 Claims**



1. In combination with a spring strip having a plurality of transversely extending torsion bars spaced apart longitudinally of the strip, an extender spring positioned above and mounted on one end of said strip, said spring comprising a wire body formed at one end with a transversely extending bar and at the opposite end with a hook engaged with a first one of said torsion bars, said wire body having a transverse bar located intermediate said end bar and said hook positioned side-by-side with a second one of said torsion bars, clip means securing said side-by-side bars together, and said body having portions extending in opposite directions from opposite ends of said intermediate transverse bar which are substantially straight when viewed from above, one of said straight portions terminating in said hook which is engaged with one side of said first torsion bar, said one straight portion being engaged with the opposite side of a third one of said torsion bars located between said first and second torsion bars.

3,908,975
CONSTRUCTION APPARATUS
Donald R. Bryant, Rt. 2, Box 93-A, Alta Loma, Tex. 77510
Filed Feb. 5, 1974, Ser. No. 440,065
Int. Cl.² B25B *11/02*
U.S. Cl. 269—40 **2 Claims**

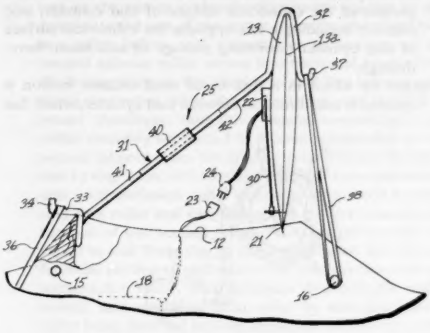


1. An apparatus for the construction of geometric segments which are used in the construction of geodesic frameworks for reinforcing and/or supporting geodesic domes, said apparatus comprising (a) a first, second and third peripheral guide member, said first, second and third peripheral guide members aligned to form the legs of a triangle, the ends of each of said first, second and third peripheral guide members being spaced apart from one another to thereby leave an opening therebetween at the point which would otherwise be the apex of the triangle so formed, each of said peripheral guide means lying in a common spherical plane to the other peripheral guide member and each of said peripheral guide members being comprised of a plurality of spaced apart, longitudinally aligned guide means, (b) a first, second and third transverse guide members, said first, second and third transverse guide members extending from adjacent to but spaced apart from said first, second and third peripheral guide members, respectively, in a line along an arcuate path to adjacent but spaced apart from another of said legs of the triangle formed by said peripheral guide members, all of the guide members of each of said first, second and third transverse guide members being substantially parallel to and lying within a common arcuate plane to all other guide members of each of said first, second and third transverse guide members, each of said transverse guide members being comprised of a plurality of spaced apart, longitudinally aligned guide means, said guide means being spaced apart at the point where it would otherwise intersect and cross a line drawn through spaced apart guide means of a guide member transverse thereto, said arcuate plane of each of said first, second and third transverse guide members being substantially parallel and spaced apart from one another a distance approximately equal to the thickness of the material to be guided by said guide means in the course of using said apparatus for the construction of geometric segments for the ultimate construction of geodesic domes, and one of said arcuate planes of said first, second and third guide transverse guide members lying such that the guide members therein will terminate such that outward extension thereof would intersect the line formed by the peripheral guide members adjacent each end thereof.

3,908,976
WING SUPPORT FOR MODEL AIRCRAFT
Robert G. Petrinec, 617 S. East Ave., Oak Park, Ill. 60304
Filed Apr. 10, 1974, Ser. No. 459,609
Int. Cl.² A63H *27/02*; **B25B** *11/02*
U.S. Cl. 269—40 **6 Claims**

1. A wing support for model aircraft comprising: an elongated member, a wing-edge-engaging bight portion formed at one end of said elongated member, a fuselage-engaging portion formed at the other end of said elongated member, and holding means formed at each end for temporarily firmly connecting the wing support to a wing and fuselage of a model aircraft so that the wing is held in a position with the chord thereof at an angle of between 30° and 90° relative to a wing

saddle formed on the fuselage, whereby connection and adjustment of interrelated components between the wing and the



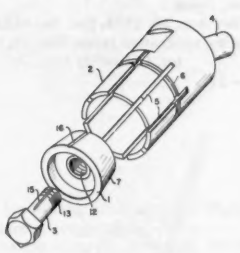
fuselage can be made while the wing is supported on the fuselage.

3,908,977

ULTRAHIGH VACUUM MOUNTING FIXTURE

Wallace W. Roepke, Excelsior, and Alexander I. Grabowski, Minneapolis, both of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 3, 1974, Ser. No. 457,667
Int. Cl.[2] B23Q *3/02*; F16M *13/00*
U.S. Cl. 269—287 **10 Claims**



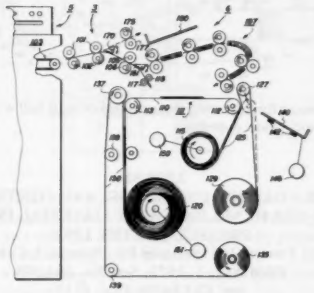
1. A mounting assembly for use with an ultrahigh vacuum chamber comprising:
- an elongated hollow open ended tapered sleeve with a plurality of spaced longitudinal slots extending from the hollow open end to part way up the sleeve;
- a tapered plug having means for receiving a tightening member insertable within the hollow open end of said sleeve;
- a tightening member insertable in said plug's means for receiving a tightening member for expanding said plug upon tightening and for retaining the plug within the sleeve;
- said tightening member having means for allowing the escape of gas trapped by said plug and tightening member in said ultrahigh vacuum chamber as said member is tightened; and
- a mounting post fastened to the end of the sleeve opposite its hollow open end for mounting a device in a chamber.

3,908,978

BINLESS SORTING APPARATUS

Denis J. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1972, Ser. No. 319,838
Int. Cl. B65h *39/00*
U.S. Cl. 270—58 **3 Claims**



1. In a reproduction apparatus in which copy sheets reproduced from document information are distributed, an improved sorting apparatus comprising:
- a frame
- first roll means positioned on said frame including first and second belt members adapted to receive copy sheets advanced along a path therebetween,
- second roll means on said frame for receiving one of said belt members arranged along a path which has a copy sheet loading station located at a planar portion of the belt path at which copy sheets are loaded thereon and a third belt member adapted to receive copy sheets subsequent to loading of the sheets on the loading belt member therebetween,
- drive means for driving said first and second roll means to move said loading belt member past said copy sheet loading station to receive and separate copy sheets by positioning each copy sheet at a separate location on said loading belt member and then moving said loading belt member into loaded contact with another of said belt members to trap copy sheets therebetween,
- means to reverse said roll drive means at predetermined intervals to move the belt members in an opposite direction to position subsequent copy sheets in overlying relation to sheets previously loaded on said loading belt member to store at least partially completed copy sets on said roll means,
- means associated with one of said roll means for separating said belt member to unload copy sets into a receiving tray member.

3,908,979

METHOD AND APPARATUS FOR FORMING PACKAGES

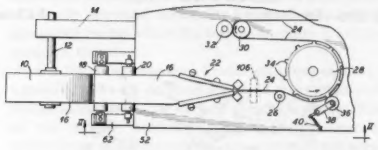
Charles E. Cloud, Wilmette, and Donn Allan Hartman, Zion, both of Ill., assignors to R. A. Jones & Co. Inc., Covington, Ky.

Filed Apr. 11, 1973, Ser. No. 350,096
Int. Cl. B65h *45/22*
U.S. Cl. 270—86 **10 Claims**

1. Apparatus for longitudinally folding an elongate strip of web material comprising,
- a pair of guide members each having a guide slot for receiving opposite sides edges of said web,
- means for supporting said guide members in fixed relation, with the upstream ends of said guide members being relatively widely spaced and the downstream ends of said guide members being narrowly spaced,

means for feeding said web into said slots at the widely spaced end of said guide members,

a ball mounted between said guide members and engageable with said web intermediate its side edges,



and means for adjusting the position of said ball with respect to said guide members.

3,908,980

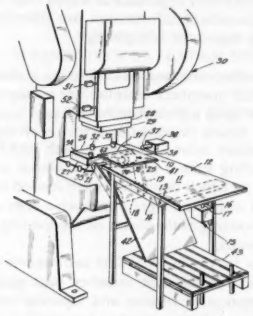
WORK LOADING, UNLOADING, AND POSITIONING MEANS FOR HANDLING SHEET MATERIAL IN POWER PRESSES AND THE LIKE

Alexander Fowler, 334 Westover Rd., Stamford, Conn. 06902

Filed Aug. 2, 1973, Ser. No. 384,888

Int. Cl.[2] B65H *5/06, 9/10*

U.S. Cl. 271—3 **7 Claims**



1. Feeding and positioning apparatus for moving sheets along a feed path to a work station of a power operated machine from a supply station located to the rear thereof; said apparatus including positioning front stop means at said work station and disposed transverse to said feed path, positioning said stop means at said work station at one side of said feed path, power operated roll means disposed to the rear of said work station positioned to engage a sheet at said supply station and upon forward rotation of said roll means drive this sheet forward until movement thereof is arrested by engagement of its leading edge with said front stop means, means for moving a sheet sideways to move a side edge of a sheet at said work station against said side stop means, said roll means includes electromagnetic sheet holding means divided into first and second portions spaced along the rotational axis of said roller means and positioned on opposite sides of a center line for said feed path, and means for energizing each of said portions while the other is deenergized.

3,908,981

SHEET WRAPPING AND UNWRAPPING APPARATUS

Seymour Naroff, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 26, 1974, Ser. No. 445,966

Int. Cl.[2] B65H *5/00*

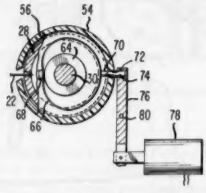
U.S. Cl. 271—3 **4 Claims**

1. Apparatus for wrapping as sheet onto and unwrapping it from a cylinder comprising, in combination:

a cylinder having means for accepting an edge of said sheet;

a member coaxially located with said cylinder, having an inner cylindrical surface which coextends with at least a portion of the cylindrical surface of said cylinder, said member including a slot opposite the cylindrical surface of said cylinder permitting passage of said sheet therethrough;

means by which in a first mode axial relative motion is created in one direction between said cylinder, which has



accepted said edge of said sheet, and said member for pulling said sheet through said slot and wrapping it around said cylinder and by which in a second mode axial relative motion is created in the opposite direction between said cylinder and member for unwrapping said sheet from said cylinder through said slot; and

means by which in a third mode said member is caused to rotate with said cylinder after said sheet has been wrapped around said cylinder and before said sheet has been unwrapped.

3,908,982

INFEED MECHANISM FOR SHEET PROCESSING APPARATUS

Masahiro Abe, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Japan

Filed Apr. 30, 1974, Ser. No. 465,668

Claims priority, application Japan, May 10, 1973, 48-51793

Int. Cl.[2] B65H *3/06*

U.S. Cl. 271—21 **3 Claims**

1. In a sheet processing apparatus wherein sheets held in neat arrangement are successively fed into the apparatus for counting, identifying or like purposes, an infeed mechanism comprising:

a first takeout roller rotatably supported adjacent one edge of the neat arrangement of sheets for frictional contact with each foremost sheet thereof;

at least one second takeout roller rotatably supported adjacent the opposite edge of the neat arrangement of sheets in parallel spaced relationship to said first takeout roller and including a circumferential portion adapted for frictional contact with each foremost one of the sheets at prescribed time intervals, said second takeout roller being maintained in constant rotation during operation of the apparatus; and

drive means operatively positioned for imparting the rotation of said second takeout roller to said first takeout roller at prescribed time intervals such that each foremost one of the sheets is thereby frictionally caused to shift relative to the rest of the sheets toward said second takeout roller before said circumferential portion of said second takeout roller moves into frictional contact with the foremost sheet, the rotation of said first takeout roller being suspended when the shifted foremost sheet is released therefrom, said drive means comprising a cam roller rotatably supported in coaxial relationship to said second takeout roller for simultaneous rotation therewith and having a circumferential portion of increased radius, and a transmission roller rotatably supported between said cam roller and said first takeout roller, whereby the rotation of said second takeout roller is frictionally conveyed to said first takeout roller only when said circumferential portion of said cam roller is in contact with said transmission roller, each foremost sheet initially shifted toward said second takeout roller by said first takeout roller being then fed into the apparatus by said circumferential portion of said second takeout roller.

3,908,983

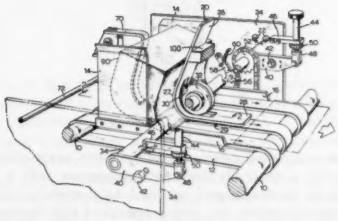
CARD FEEDER

John Albert Long, 45 Hemlock St., Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 330,328, Feb. 7, 1973, abandoned. This application Jan. 21, 1974, Ser. No. 435,185

Int. Cl.[2] B65H *3/06, 1/06*

U.S. Cl. 271—35 **10 Claims**



1. A device for feeding cards and like paper stock singly from a stack thereof, comprising:

a conveyor having a planar, forwardly movable platform and drive means therefor;

means to hold the stack of cards above the platform in a downwardly sloping position in the forward direction of travel of the platform and spaced therefrom, said holding means comprising a forward guide bar and a rearward retainer bar each having a forwardly curving lower portion to fan the bottom cards of the stack forwardly as the cards move downwardly in the holding means between the bars under the weight of the stack;

circular, rotatable friction means positioned above the platform forwardly of the guide bar of the holding means and a vertical plane lying in the direction of movement of the platform, the friction means being spaced from the platform to provide a gap allowing free passage of a single card therethrough and projecting below the forwardly curving lower portion of the guide bar to provide an exposed arc whereby as the cards move downwardly and forwardly in the stack the leading edge of the lowest card held by the stack contacts the exposed arc of the friction means; and

means to rotate the friction means to advance said lowest card towards said gap.

3,908,984

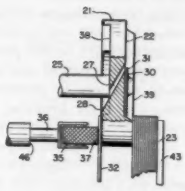
FILM SEPARATOR

Edwin L. Sohngen, Cincinnati, Ohio, assignor to Sybron Corporation, Rochester, N.Y.

Filed July 23, 1973, Ser. No. 382,048

Int. Cl. B65h *3/28*

U.S. Cl. 271—113 **14 Claims**



1. Apparatus for separating sheets from a stack comprising:

a disc positioned with a front face parallel to the top sheet of the stack and with the axis of the disc generally perpendicular to but not intersecting the top sheet;

means for pressing the stack against said front face;

a slot extending diagonally through the edge of the disc from the front face to a rear face of the disc;

an edge projecting next to the slot approximately the thickness of one of said sheets from the front face, whereby as the disc rotates the top sheet is picked up by the projecting edge and fed laterally through the disc; and

a roller having its rim pressed against said rear face, whereby when the top sheet reaches the rear face the sheet is gripped between the rear face and the roller and is advanced as the disc continues to rotate.

3,908,985

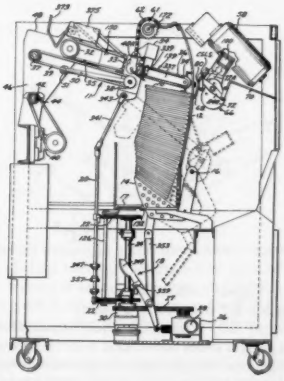
METHOD AND MEANS FOR STACKING ARTICLES

Raymond L. Wiseman, 1550 S. Macon St., Aurora, Colo. 80012

Continuation-in-part of Ser. No. 197,744, Nov. 11, 1971, abandoned. This application Aug. 21, 1973, Ser. No. 390,295

Int. Cl.[2] B65H *29/34, 29/50*

U.S. Cl. 271—189 **16 Claims**



1. In a stacker of the kind that receives articles in a stream and forms them into a series of stacks, in combination:

a frame;

a stacking platform carried by said frame at a stacking location;

an article conveyor pivotally mounted on said frame with its discharge end positioned at said stacking location at a height variable with pivotal movement of said discharge end;

conveyor pivoting control means for maintaining said discharge end in close proximity to the top of forming stacks of articles during formation of the stack except at the time of initiation of a new stack;

said conveyor pivoting control means comprising a member carried by said discharge end and extending toward said platform and means sensitive to the pressure applied to said member from the direction of said platform for raising the platform in response to pressures greater than some given pressure and for lowering the platform in response to pressures less than a given pressure.

16. The method of stacking folded papers arriving at a stacking position in a stream which includes the step of catching a number of papers on a pile such that they lie one atop the next on their broad surfaces in an upper plane which is tilted toward the folded edge;

depositing the pile of papers vertically downward to a similarly tilted lower plane;

permitting an additional quantity of papers to be added to the pile to form a stack of given size;

after the stack has reached said given size, catching subsequently arriving papers at said upper plane in a second pile while moving the stack laterally to clear the space below the pile;

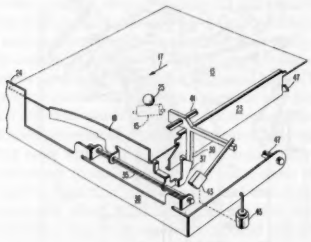
the stack being lowered from the tilted plane to a substantially horizontal plane prior to being moved laterally; and the stack being formed such that the upper papers of the stack are arranged such that the upper papers of the stack are arranged such that successively higher papers have their folded edge extending partly over the folded edge of the paper below and such that the folded edges of lower papers lie one above the other whereby the folded edge of the stack is concave when the stack is lowered from the tilted plane.

3,908,986

SHEET ALIGNING MECHANISM

Charles Dale Bleau, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 15, 1973, Ser. No. 371,086
Int. Cl.[2] B65H *9/06, 9/16, 9/18*
U.S. Cl. 271—227 **5 Claims**



1. A sheet aligner comprising:

a sheet guide for supporting a sheet;

a first aligner stop positioned adjacent said sheet guide for intercepting a sheet forwarded over the sheet guide;

a second aligner stop positioned approximately perpendicular to said first aligner stop in the plane of sheet travel for intercepting a sheet forwarded over the sheet guide;

a sheet forwarding device for intermittently forwarding a sheet over the sheet guide to the aligner stops, said sheet forwarding device including an eccentrically mounted roll and a cooperating pinch device, the clearance between the roll and the pinch device allowing alternate engagement and disengagement of a thin sheet fed between the pinch device and roll by the roll and pinch device as the roll rotates,

said roll being canted with respect to said first aligner stop and said second aligner stop for simultaneously forwarding a sheet to said aligner stops;

sensing means for sensing the registration of a sheet against the first aligner stop and the second aligner stop;

actuable sheet gate means connected to said first aligner stop for positioning said first aligner stop in a non-intercepting position with respect to a sheet previously intercepted thereby;

actuator means responsive to the sensing means for actuating the sheet gate means to position the first aligner stop to said non-intercepting position when a sheet is registered;

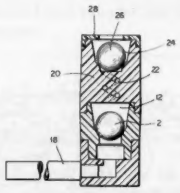
sheet take-up means located beyond the first aligner stop in the sheet feed path for receiving sheets forwarded thereto by the sheet forwarding device when the first aligner stop is in the non-intercepting position.

3,908,987

CONTROLLED POSITIVE END PRESSURE EXPIRATORY DEVICE

John R. Boehringer, 427 Parkview Dr., Wynnewood, Pa. 19096

Filed Sept. 27, 1973, Ser. No. 401,130
Int. Cl.[2] A63B *23/00*
U.S. Cl. 272—57 F **16 Claims**



13. A controlled positive end pressure expiratory device comprising a vertically disposed passageway with a circular opening at its lower end adapted to communicate with a source of expiratory air, and a spherical ball having a calibrated size and effective weight, said passageway being adapted to receive said spherical ball having a diameter greater than that of said opening and being freely movable vertically within said passageway and above said opening, said ball defining means for exerting a substantial predetermined back pressure function to said source of expiratory air, in order to provide significant resistance to the expiration of air by a user.

3,908,988

DIVING TOWERS

Urbain Avon, 5671 des Plaines Ave., 410, Montreal, Quebec, Canada

Filed May 5, 1971, Ser. No. 140,330
Claims priority, application Canada, Oct. 7, 1970, 095091
Int. Cl.[2] A63B *5/10*
U.S. Cl. 272—66 **3 Claims**

1. In combination, a height adjustable diving tower assembly comprising:

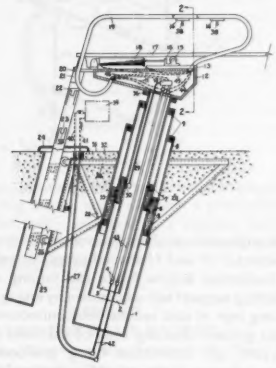
a. a diving platform including guard rail means attached thereto and upwardly extending therefrom;

b. a dove-tailed shaped track fixed to the forward portion of the upper surface of said platform, a frame having a correspondingly shaped dove-tailed lower surface slidably mounted on said track and supporting a roller thereon, a hydraulic cylinder fixed to said platform and operatively connected to said frame, a diving board fixed

at one end to said platform and with another portion thereof resting atop said roller, said frame, roller, and hydraulic cylinder providing the fulcrum adjustment for said diving board;

c. counterweight means fixed to said one end of said platform in order to compensate for the downward force caused by a dive, said counterweight means including a weight plate and ladder means;

d. a pressurized fluid lifting assembly comprising a first hollow, rigid cylinder attached to the bottom surface of said platform and extending downwardly therefrom, at least one additional rigid cylinder telescopically positioned over and concentrically spaced from said first cylinder, each of said additional cylinders having an annular stop ring fixed to its upper inner surface, a pair of



annular seal rings interfitted between adjacent cylinders, each of said pairs comprising an upper seal ring fixed to an innermost adjacent cylinder and a longitudinally spaced apart lower seal ring fixed to an outermost adjacent cylinder, the space between said upper and lower seal rings constituting an annular chamber of compression for receiving pressurized fluid therein, each of said annular chambers of compression being operatively related to each other by openings formed in adjacent cylinders and with one cylinder being imperforate;

e. means providing pressurized fluid to said lifting assembly: and

f. said guard rail means including control valve means for controlling said pressurized fluid means and said hydraulic fulcrum cylinder.

3,908,989

SKILL TYPE GAME UTILIZING TRACKS AND VEHICLES

Burton C. Meyer, Downers Grove, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

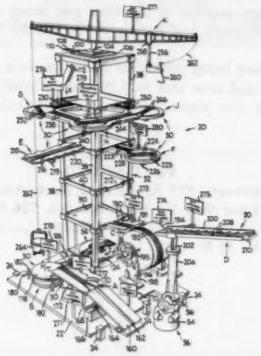
Filed Sept. 4, 1974, Ser. No. 503,136
Int. Cl.[2] A63F 9/00; A63H 17/00, 18/08, 18/16
U.S. Cl. 273—1 R **14 Claims**

1. A skill-type game comprising:

a self-propelled playing piece having guide means for following a track and ground engageable driven wheels to support and propel the playing piece; and

means defining a generally columnar obstacle course having a plurality of different levels over which the playing piece is to traverse including a plurality of stations at least some of which are mounted at said different levels, stationary track means between at least some of the stations, movable track means associated with at least some of said stations, said playing piece guide means being engageable with said stationary and movable track means, and said movable track means being alignable with said stationary track means to maintain said playing piece moving in engagement with said stationary track means.

at least one of said stations defining a transport station which is selectively movable vertically between the levels of the obstacle course for moving the playing piece from



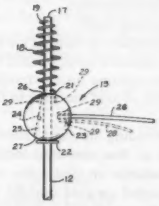
one level to another, the directing means on said transport station including rotatable track means and lost drive motion means associated with said track means for rotating said track means, said playing piece wheels being engageable with said drive means to rotate the rotatable track while the playing piece remains in the same position on said transport station until the rotatable track is aligned with the succeeding track portion.

3,908,990

BASEBALL BATTING PRACTICE APPARATUS

Larry L. Spurgeon, 609 Eagle St., Washington, Ill. 61571

Filed Nov. 15, 1974, Ser. No. 524,129
Int. Cl.[2] A63B 69/40
U.S. Cl. 273—26 E **4 Claims**



1. A baseball batting practice apparatus comprising:

an elongated shaft member having a first ground engageable end and having a second opposite end which is free and upstanding when said shaft is engaged with the ground, said shaft having a collar member intermediate said first and second ends;

a spring member having an upper end and a lower depending end, said upper end being affixed to said second end of said shaft, said spring member depending from said second end and encircling said shaft;

a support member having an internal wall forming a bore through said support member, said shaft being received through said bore, said support being rotatable about said shaft and movable along said shaft between said collar

member and said second end, said lower depending end of said spring being affixed to said support, said internal wall forming a bore which is conical in shape, said support member having upwardly and downwardly directed openings of said bore, said upwardly directed opening being smaller than said downwardly directed opening and being substantially the diameter of said shaft, whereby said arm and said ball are allowed to move in more than one plane when said ball is struck;

a flexible arm member at an inner end being affixed to said support member and having an outwardly extended end; and

a ball member being affixed to said outwardly extended end, whereby said arm and said ball are allowed to move in more than one plane when said ball is struck.

3,908,991

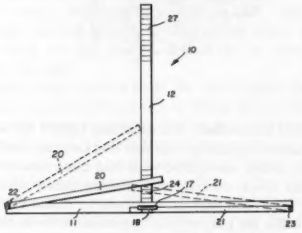
PUTTING AID

Erving H. Schwartz, 575 Averill Ave., Rochester, N.Y. 14607

Filed Nov. 22, 1974, Ser. No. 526,112

Int. Cl.² A63B *57/00*

U.S. Cl. 273—32 R **7 Claims**



1. A putting aid comprising:

a. a base bar;

b. an upright bar pivotally connected to a central region of said base bar to be foldable into parallel relation with said base bar;

c. means for holding said upright bar in a position perpendicular with said base bar during use of said aid;

d. clip means on said upright bar for attaching said upright bar to the shaft of a putter;

e. a bubble level on said base bar for leveling said base bar accurately horizontally;

f. a pair of sighting bars;

g. means for pivotally mounting each of said sighting bars on respective opposite ends of said base bar;

h. each of said sighting bars extending from said respective opposite ends of said base bar to the region of said upright bar;

i. a scale extending upward from said base bar on said upright bar so that elevated inclinations of said sighting bars are readable on said scale; and

j. a table arranged on said upright bar above said scale for computing lateral distance from a hole for aiming a putt, said lateral distance being a function of putt distance and green inclination as measured by one of said sighting bars and said scale.

3,908,992

PORTABLE FOOTBALL GOAL POST

Donald C. Cunningham, St. Francis Dr.; Esse Harold Keyes, Rt. 6, Box A-22, and Tom W. Cox, Rt. 2, all of Philadelphia, Miss. 39350

Filed Jan. 29, 1974, Ser. No. 437,680

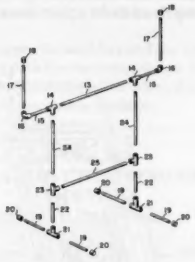
Int. Cl.² A63B *67/00*

U.S. Cl. 273—55 R **1 Claim**

1. A stable, portable knockdown goalpost assembly comprising:

a. a U-shaped cross bar sub-assembly having a first horizontal hollow rod engaged at each end in a tee connector, second horizontal hollow rods engaged in said tee connectors and ninety degree elbow connectors, vertical hollow rods engaged in said ninety degree elbow connectors, and said vertical hollow rods closed at their extreme ends by rod caps;

b. two ground abutting support sub assemblies, each said sub assembly having first horizontal ground abutting hollow rods closed at their extreme ends by rod caps and engaged at their inboard ends in a first tee connector, a first vertical hollow rod engaged in said first tee connector and a second tee connector, a second vertical hollow



rod engaged in said second tee connector and in said tee connector of said U-shaped cross bar sub-assembly;

c. a horizontal hollow brace rod joining said two ground abutting support sub assemblies by engaging in the inward facing legs of said second tee connectors;

d. said ground abutting rods of said two ground abutting support sub assemblies being positioned substantially perpendicular to the axis of said cross bar assembly;

e. each said hollow rod, said tee connector, said ninety degree elbow connector and said rod cap being joined in fluid tight, disengageable engagement; and

f. a stabilizing weight of water within said goal post assembly.

3,908,993

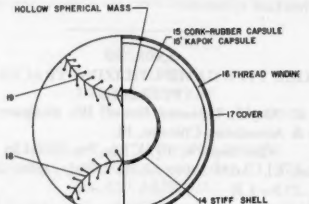
CENTERLESS THICK-WALLED GAME BALL

Joseph A. Gentiluomo, 1456 Belmont Ave., Schenectady, N.Y. 12308

Division of Ser. No. 142,565, May 12, 1971, abandoned. This application Nov. 8, 1973, Ser. No. 414,115

Int. Cl.² A63B *37/02*

U.S. Cl. 273—60 R **11 Claims**



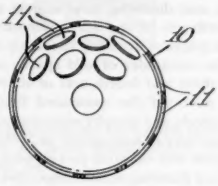
1. A hollow game ball for use in playing such games as baseball or softball, comprising, a thick-walled hollow spherical mass of such weight distribution as to have a moment of inertia greater than the moment of inertia of a filled ball of equivalent size and weight, and sewn patterned contouring disposed within the exterior surface of said hollow spherical mass; said greater moment of inertia over said filled ball being

of such magnitude as to cause a reduction in Magnus Effect to such a level as to provide improved aerodynamic characteristics.

3,908,994
BADMINTON BALL

Karl Gustav Aström, Folkungagatan 146, S-30, Sweden (S-116 30)

Filed Sept. 16, 1974, Ser. No. 506,182
Claims priority, application Sweden, Sept. 17, 1973, 73125916; Aug. 20, 1974, 74105644
Int. Cl.² A63B *39/00*
U.S. Cl. 273—61 R **3 Claims**

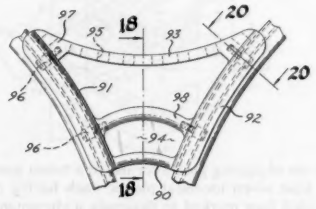


1. A hollow, perforated, round ball for use in playing badminton, comprising a thin shell wherein a great number of holes are symmetrically arranged in a regular, continuous pattern, the total area of the holes being at least 40 percent of the total ball defining surface.

3,908,995
YOKE FOR GAME RACKET

William E. Portz, Geneva, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Filed June 21, 1972, Ser. No. 264,820
Int. Cl.² A63B *49/02, 49/12*
U.S. Cl. 273—73 G **9 Claims**

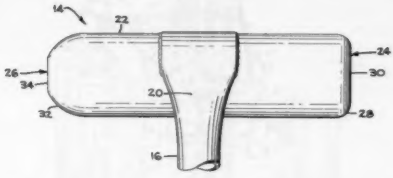


1. A game racket comprising an elongated frame member formed into a loop and having converging portions forming a throat and handle portions extending beyond said throat; said racket having a longitudinal axis; a yoke disposed parallel with the plane of said loop and connecting said converging portions of said elongated frame member across said throat; said converging portions having inner surfaces directed toward said axis, outer surfaces directed away from said axis, and substantially parallel front and rear side surfaces; said yoke having on each lateral side an oppositely facing, converging grip portion which is wider than said converging portions in a front to rear direction and comprises a bottom wall and outwardly directed substantially parallel flanges defining a channel shaped to substantially conform to the inner surfaces of said converging portions of said frame member, said inner surfaces of said converging portions nesting within said channels between flanges and on said bottom wall and said flanges surrounding substantial portions only of said front and rear sides of said converging portions of said frame member; means securing said channels to said converging portions of the frame member; said yoke also having a bridge means connecting said grip portions to each other across said throat, said bridge means including (a) string mounting means disposed along the lateral edge of the bridge means facing inwardly of said loop, and (b) a rigid body portion disposed on the outward side of said string mounting means away from said loop.

3,908,996
GAME BALL RAMMER

John M. Molinaro, 340 Nancy Ln., San Jose, Calif. 95127

Filed Aug. 2, 1974, Ser. No. 494,378
Int. Cl.² A63B *59/10*
U.S. Cl. 273—83 **6 Claims**



1. An instrument for striking a relatively hard plastic ball, comprising:

a. an elongated cylindrical head of hard and relatively unyielding metal having a first striking surface comprising the cylindrical surface of said rammer head, said rammer head having adjacent one end thereof a first arcuate surface curved toward the axis of said cylindrical surface for a predetermined first arcuate distance and joined tangentially with said cylindrical surface at one edge and with said rammer head terminating in a second striking surface at said one end, said second striking surface having a planar ball striking surface perpendicular to said axis and being tangent to said first arcuate surface at its other edge, said rammer head having adjacent the other end thereof a second arcuate surface curved toward said axis for a predetermined second arcuate distance and joined tangentially with said cylindrical surface at one edge and with said rammer head terminating in a third striking surface at said other end, said third striking surface having a planar ball striking surface perpendicular to said axis and being tangent to said second arcuate surface at its other edge, said first arcuate distance being different than said second arcuate distance and said third striking surface having a greater area than said second striking surface; and

b. a shaft; said shaft having a handle at one end and head attachment means at its other end for securing said shaft to said rammer head perpendicularly thereto.

3,908,997
TARGET GAME

Jeffery D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 20, 1973, Ser. No. 426,797
Int. Cl.² A63D *3/02*
U.S. Cl. 273—119 A **3 Claims**

2. An amusement game device, comprising:

means defining a tilted playing surface upon which a playing object may be propelled, said playing surface having an upper end and a lower end;

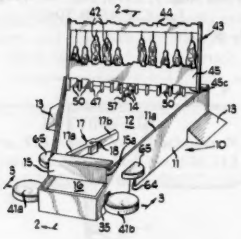
a ball to be propelled upon said playing surface;

a ball propelling device located in proximity to said playing surface near the lower end thereof so as to be capable of propelling a ball upon said playing surface, said propelling device being manually manipulatable to effect pro-

pelling of said ball in various directions upon the playing surface;

a target positioning member mounted on the playing surface near the upper end thereof capable of positioning the target in a plurality of positions;

a target suspended from said target positioning member, said target including target anchoring means for releasably anchoring said target in the path of said ball when propelled by said propelling device, whereby said target is moved to another position when struck by said ball;



an upper ball reservoir located behind said target positioning member;

a lower ball reservoir located behind said propelling device; an aperture formed in said playing surface in front of said upper reservoir and designed to receive said ball therefrom; and

means for ejecting said ball from said aperture thereby placing the ball in play.

3,908,998

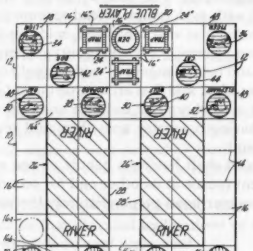
BOARD GAME APPARATUS

Wai Min Fong, 22641 Doremus, St. Clair Shores, Mich. 48080

Filed Apr. 18, 1973, Ser. No. 352,090

Int. Cl. A63f *3/00*

U.S. Cl. 273—131 AB **3 Claims**



1. A game apparatus comprising a board having a plurality of columns extending longitudinally of said board and each containing a plurality of spaces with laterally adjacent spaces of adjacent columns being generally aligned with each other to form a grid-like array of said spaces defining a playing area on said board, first and second sets of a plurality of game-pieces each adapted to be received on one of said spaces of said board and to be moved on said spaces independently of the other of said game-pieces on said board, each of said game-pieces of each set having animal ranking indicia means individually associated therewith on an upper face thereof visibly exposed to the view of both players of said game apparatus when situated at the opposite longitudinal ends of said board, said ranking indicia means visibly identifying a differing power or rank thereof relative to every other of said game-pieces of said set, said ranking indicia means of each set of game-pieces depicting a selected set of members of the animal kingdom each differing from every other said member and characteristically capable of connoting said ranking of the power of the game-pieces relative to one another, goal indicia means on first and second selected ones of said spaces distinguished in appearance from the remainder of said spaces and defining first and second goal spaces disposed on said board respectively adjacent the longitudinally opposed ends of said playing area, and disabling zone indicia means on selected third and fourth sets of said spaces identifying said third and fourth sets of spaces as disabling spaces by differing in appearance from the remainder of said spaces and from said goal spaces, said third and fourth sets of disabling spaces being disposed to surround the associated first and second goal spaces respectively and thereby separate said goal spaces from all of the remainder of said spaces such that members of said first and second sets of game-pieces must pass through said fourth and third disabling spaces respectively in order to enter said second and first goal spaces respectively, each of said disabling spaces being effective to decrease the power or rank of at least some opposing game-pieces only while such opposing game-pieces are in an opposing disabling space.

3,908,999

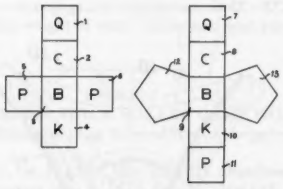
MODIFIED CHESS GAME APPARATUS

Donald E. Brown, 4300 Harbor View Ave., Oakland, Calif. 94619

Filed Nov. 14, 1974, Ser. No. 523,674

Int. Cl.² A63F *3/02*

U.S. Cl. 273—131 KC **6 Claims**



3. A set of playing pieces for use in a board game comprising at least seven identical pieces, each having at least five faces, each face marked to designate a chessman other than a king chessman, and each piece having at least one face marked to designate each of the chessmen other than the king chessman, and a unique piece designated as a king chessman.

3,909,000

CYLINDRICAL CHESS GAME APPARATUS

David A. Akers, 20970 Pawnee Trail, Los Gatos, Calif. 95030

Filed Nov. 11, 1974, Ser. No. 522,938

Int. Cl.² A63F *3/02*

U.S. Cl. 273—131 AD **6 Claims**

1. A game apparatus comprising:

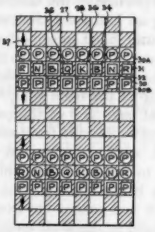
two sets of chess pieces;

a cylinder having a playing surface marked with playing positions in a plurality of ranks and files;

each set of chess pieces comprising a plurality of major pieces equal in number to the number of files on the playing surface and a plurality of pawns equal in number to twice the number of files on the playing surface,

said cylinder including a number of ranks of playing positions exceeding the total number of ranks of chess pieces

to enable the playing of cylindrical chess on the palying surface, and



said sets being distinguishable from each other and half of said pawns of a set being distinguishable from the other half of the same set.

3,909,001

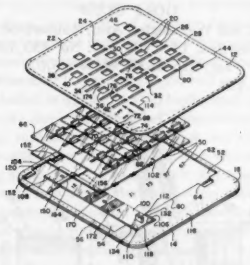
BINGO CARD WITH ARRAY MODIFICATION MEANS

Marion L. Feldhausen, 6401 Scottsville, Wichita, Kans. 67219

Continuation of Ser. No. 311,479, Dec. 4, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 530,657

Int. Cl.[2] A63F *3/06*

U.S. Cl. 273—136 F **14 Claims**



1. In a bingo playing card of the type wherein the card has thereon a positional array of vertical columns and horizontal rows of numerical indicia constituting numerical sequences that are normally displayed to view, the improvement comprising in combination therewith of indicia carrying means for selectively obscuring a portion only of the indicia constituting one of said displayed indicia sequences while exposing to unobscured view the indicia constituting the remaining portion of such one of said displayed sequences while displaying to view other numerical indicia in lieu positionally of that obscured by such means, whereby an alternative and different numerical sequence from said one sequence is exposed to view, said means including a selector member slidably mounted on the card for reciprocating movement between limiting first and second positions and operative in said respective positions selectively to display said one sequence and to display said alternative sequence while obscuring said portion of the indicia, said selector member carrying for movement therewith said other numerical indicia, with said selector member being movable relative to the indicia on the card.

3,909,002

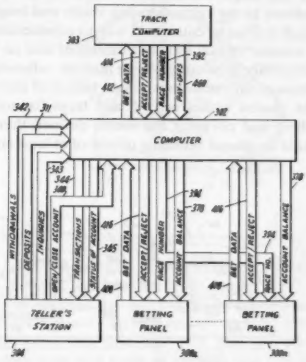
DATA-PROCESSING SYSTEM FOR DETERMINING GAINS AND LOSSES FROM BETS

David Levy, 230 W. 54th St., New York, N.Y. 10003

Division of Ser. No. 25,227, April 2, 1970, Pat. No. 3,810,627, and a continuation-in-part of Ser. No. 699,509, Jan. 22, 1968, abandoned. This application Mar. 4, 1974, Ser. No. 447,782The portion of the term of this patent subsequent to May 14, 1991, has been disclaimed.

Int. Cl.[2] A63B *71/06*

U.S. Cl. 273—138 A **10 Claims**



1. A data-processing system for determining gains and losses from bets on a fortuitous event, comprising:

a player's station remote from the site of said event;

first selector means at said player's station operable by a player to indicate an amount wagered on the outcome thereof;

second selector means at said player's station operable by the player to choose one of several types of wagers;

register means at said player's station inaccessible to the player following operation thereof to display an initial credit balance, said register means being responsive to said first selector means for deducting the wagered amount from said balance;

calculating means coupled to said second selector means for determining an odds factor from the chosen type of wager;

arithmetic means coupled to said register means and to said calculating means, said arithmetic means being actuatable under the control of said first selector means, upon an outcome of said event in conformity with the wager, for additively introducing into said register means said wagered amount multiplied by said odds factor to increase the existing credit balance;

a control station at the site of said event;

actuating means for said arithmetic means at said control station; and

transmission means linking said actuating means to said arithmetic means.

3,909,003

AREA-MATCHING PUZZLE-GAME

Luis J. Rabinovich, c/o P.O. Box 18948, Cimerron Station, Los Angeles, Calif. 90018

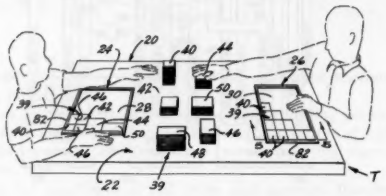
Filed Apr. 17, 1972, Ser. No. 244,826

Int. Cl. A63f *9/10*

U.S. Cl. 273—157 R **10 Claims**

1. An area-matching puzzle-game comprising: a plurality of tablets comprising a single co-planar set, each tablet being of substantially rectangular configuration; at least one tablet-receiving tray, each tray being of rectangular configuration and defining a corresponding upwardly open single-tablet-layer, multiple-tablet-combination table-receiving recess for

receiving in a substantially-exact area-coextensive manner single-layer arrangements of at least four-per-tray different rectangular-area-defining combinations of certain selected ones of said tablets, the receiving recess defined by each rectangular tray having a width dimension and a length dimension comprising multiples of a selected dimension element unit, and each tablet of said coplanar set having a width dimension and a length dimension comprising multiples of said same selected dimension element unit and comprising a corresponding fractional part of the corresponding width and length dimensions of the receiving recess of each tray, with said width and length dimensions of each tablet being, therefore, so related to the corresponding width and length dimensions of each tray as to cause said tray to substantially exactly receive a number of said different tablets of said co-planar set in a substantially area-coextensive manner whereby various combinations of different ones of said tablets of said co-planar set can be placed within any of said trays for substantially exactly filling and covering the recess defined thereby, each tablet of said co-planar set being of one of at least six different



types having corresponding different surface areas, with the tablet of each different type each having a width dimension comprising either the same multiple of said selected dimension element unit or a different multiple of said selected dimension element unit from the width dimension of each tablet of a different one of said multiple different types, no tablet having a width dimension which is an integral multiple of the width dimension of any other tablet, thus being related to each other, with the one of greater width dimension being effectively multiplied by an improper fraction relative to the one of lesser width dimension, with the tablet of each different type each having a length dimension comprising either the same multiple of said selected dimension element unit or a different multiple of said selected dimension element unit from the length dimension of each tablet of another one of said multiple different types, no tablet having a length which is an integral multiple of the length of any other tablet, thus being related to each other, with the one of greater length dimension being effectively multiplied by an improper fraction relative to the one of lesser length dimension.

3,909,004

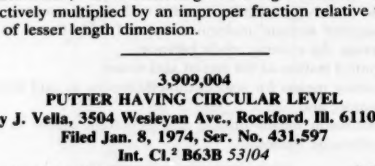
PUTTER HAVING CIRCULAR LEVEL

Tony J. Vella, 3504 Wesleyan Ave., Rockford, Ill. 61108

Filed Jan. 8, 1974, Ser. No. 431,597

Int. Cl.[2] B63B *53/04*

U.S. Cl. 273—162 B **3 Claims**



1. An improved putter including a shaft having one end adapted to be held by a golfer, and a putter head fixed to the other end of the shaft, characterized by said putter head having:

a front wall defining an elongate, generally planar, ball-engaging face;

a bottom wall having a convex arcuate lower surface from the toe to heel portion of the club head;

said walls having an L-shaped cross-section in the central area of the putter head intermediate the ends thereof, without any material contiguous to the central area of the back side of the front wall and without any reinforcing flange at the top of the front wall;

an enlargement at each end of the putter head above the bottom wall and behind the front wall to provide mass to the club head, each enlargement extending upwardly approximately to the top of the front wall;

a shaft mounting block between said enlargements above the bottom wall and behind the front wall;

the shaft being fixed to the shaft mounting block at a location so that the center of percussion is at the midpoint of the ball-engaging face;

a circular level having a sensitivity in the range of about 100 to 240 minutes per one-tenth inch of movement, the circular level being operatively aligned with the ball-engaging face to indicate when the face lies at a pre-selected angle to the horizontal and with the shaft to indicate when the axis of the shaft is at a pre-selected angle to the vertical; and

a rearwardly-extending support cantilevered rearwardly from the top of the front wall for holding the circular level at said alignment and for permanently mounting the circular level on the putter head behind the front wall adjacent the top thereof and midway between the ends of the putter head, and the support having a width substantially less than the length of the top of the front wall.

3,909,005

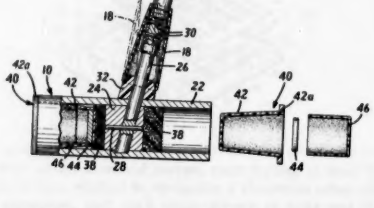
GOLF CLUB

Geza A. Piszel, 300 Washington Ave., Rutherford, N.J. 07070

Filed Jan. 15, 1974, Ser. No. 433,528

Int. Cl.[2] A63B *53/04, 53/02*

U.S. Cl. 273—171 **3 Claims**



1. A golf club having a shaft and a head, the head comprising

a tubular member having a smooth outer ball-contacting surface,

a pair of manually removable weight assemblies, one of said weight assemblies being releasably secured within each end of said tubular member, each of said weight assemblies comprising

a first cup-shaped element of resilient material having a radial flange extending about the periphery of its open end, the outer diameter of said first cup-shaped element being such as to securely retain the weight assembly within said tubular member with the end of the latter abutting the radial flange on said cup-shaped member, and the outer diameter of said radial flange being substantially the same as the outer diameter of said tubular member,

a weight member of preselected weight securely retained within the first cup-shaped element adjacent its closed end, and

a second cup-shaped element having an outer diameter such as to be securely retained within said first cup-shaped element and a length such that when inserted in said first cup-shaped element its closed end is substantially flush with the open end of said first cup-shaped element,

and means connecting said shaft to said tubular member intermediate its ends.

3,909,006

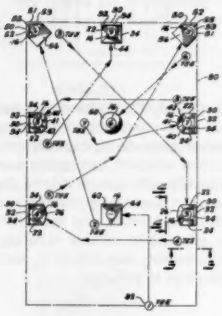
GOLF PUTTING GAME

Roland R. Arbaugh, 2316 E. 290 St., Wickliffe, Ohio 44092

Filed Jan. 16, 1974, Ser. No. 433,706

Int. Cl.[2] A63B *67/02, 57/00*

U.S. Cl. 273—176 AA **4 Claims**



1. In a game played with a golf ball, a striking member, and several different blocks adapted to lie in spaced apart relationship on a surface, a plurality of different blocks each comprising a base portion and rear wall, said base portion having at least one upwardly sloping front surface leading to a hole which is of diameter larger than a golf ball and which is at least partially included in a flat elevated horizontal surface, and two other upwardly sloping surfaces at opposite sides which intersect said flat surface along lines which are substantially tangent to opposite sides of said hole and which intersect said front sloping surface along lines which converge upwardly and rearwardly, said rear wall extending along and above portions of said two other sloping and flat base portion surfaces, with the rear wall above such two other and flat surfaces being inclined slightly with respect to the vertical to form an obtuse angle with said flat surface and being greater in height than the radius of a golf ball, said rear wall being spaced rearwardly of the rear peripheral portion of said hole a distance such that a golf ball may roll on said flat surface along said rear wall between said hole and said rear wall without falling into said hole.

3,909,007

PRACTICE PUTTING DEVICE INCLUDING BALANCED, INVERTED TRAPPING-RIMMING CUP

Charles W. Wuertemburg, Teaneck, and Darryl R. Dworkin, Middlesex, both of N.J., assignors to Standard Plastic Products, Inc., South Plainfield, N.J.

Filed Oct. 29, 1974, Ser. No. 518,535

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—177 A **3 Claims**

1. A practice putting device, comprising:

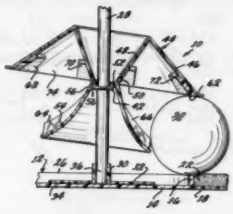
a base having an upstanding, encompassing side wall;

an upstanding pole supported by said base, said pole having an upper, free end and a lower end, said lower end being secured to said base;

a fixed torus encompassing said shaft intermediate said ends;

a trapping-rimming cup having an encompassing sidewall and an open end; and

a hollow pedestal depending from said cup and encompassing said pole, and pedestal having an internal, annular shoulder engaging said torus for supporting said cup thereon in a position such that said open end overlies said



base, said pedestal also having a portion extending below said annular shoulder for engagement by a golf ball, whereby said golf ball will swing said pedestal so that said open end of said cup will tip downwardly into trapping engagement with said golf ball, said annular shoulder coacting with said torus to prevent said cup from dropping when said golf ball impacts said pedestal.

3,909,008

PICK-UP CARTRIDGE WITH IMPROVED OSCILLATING SYSTEM

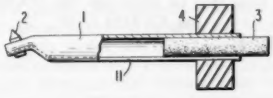
Yasunori Sakai, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed July 15, 1974, Ser. No. 488,864

Claims priority, application Japan, July 13, 1973, 48-83044

Int. Cl. G11b *3/46*

U.S. Cl. 274—37 **5 Claims**



1. In a pick-up cartridge oscillation system including a tubular cantilever member having a relatively fixed end and a relatively free end and supporting at its free end, a sound transducing needle, the improvement wherein:

said cantilever member comprises a hollow tubular member including a longitudinal slit extending inwardly from said free end at least partially the length of the tubular member and having opposed, aligned holes within said tubular member adjacent the free end, with said longitudinal slit intersecting one of said holes,

said transducing needle having a diameter approximately equal to the diameter of said hole opposite that being intersected by said longitudinal slit,

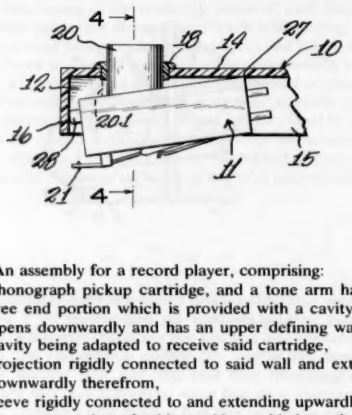
said hole having said longitudinal slit intersection being of a diameter less than that of said needle,

and wherein, said transducing needle is force fit into said aligned holes and projects from one side of said tubular cantilever member.

3,909,009
TONE ARM AND PHONOGRAPH PICKUP ASSEMBLIES

Henry J. Cvetko, Conneaut, and Michael Williams, Warren, both of Ohio, assignors to The Astatic Corporation, Conneaut, Ohio

Filed Jan. 28, 1974, Ser. No. 436,914
Int. Cl.[2] G11B 3/02
U.S. Cl. 274—37 8 Claims



1. An assembly for a record player, comprising:
a phonograph pickup cartridge, and a tone arm having a free end portion which is provided with a cavity which opens downwardly and has an upper defining wall, said cavity being adapted to receive said cartridge,
a projection rigidly connected to said wall and extending downwardly therefrom,
a sleeve rigidly connected to and extending upwardly from an upper portion of said cartridge, said sleeve having a transverse wall forming a bottom thereof,
and said upper defining wall and said projection having an opening in line with the interior of said sleeve, said opening being adapted to pass a tool which may be used to press against said sleeve bottom to dislodge said cartridge from assembly with said tone arm.

3,909,010
CORROSION PROTECTIVE COLLAR FOR UNDERGROUND PIPE JOINTS WITH METAL PARTS

Harold V. Swanson, Morris Plains, and Robert E. Bald, Roseland, both of N.J., assignors to Interpace Corporation, Parsippany, N.J.

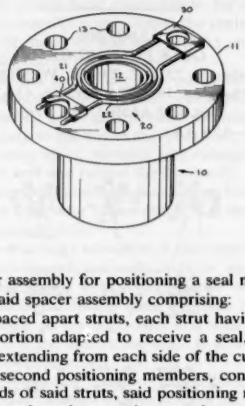
Filed May 14, 1973, Ser. No. 359,967
Int. Cl. F16j 15/10
U.S. Cl. 277—1 13 Claims

1. A method for protecting from corrosion a pipe with ferric metallic components and having a bell and a spigot, the method comprising steps as follows:
impregnating a distortable band of a cellular water invadable material with a dry hydratable cement which is reactive with water to hydrate thereby forming an alkali releasing water impervious substance,
placing the band between the spigot and the bell,
engaging the band in the joint by inserting the spigot into the bell,
allowing the band to be contacted with water whereby the hydration takes place.

3,909,011
RETAINER

John M. Sheesley, P.O. Box 14604, Houston, Tex. 77021

Filed Apr. 8, 1974, Ser. No. 459,032
Int. Cl.[2] F16J 15/00
U.S. Cl. 277—11 3 Claims

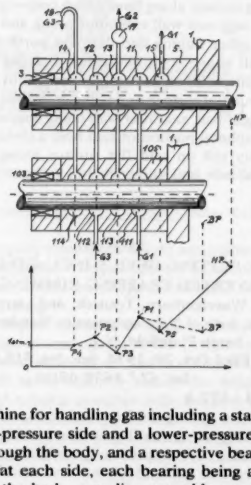


1. A spacer assembly for positioning a seal member about an opening, said spacer assembly comprising:
a pair of spaced apart struts, each strut having a centrally curved portion adapted to receive a seal, therein, and portions extending from each side of the curved portion; first and second positioning members, connected to opposite ends of said struts, said positioning members having means adapted to receive securing means whereby said spacer assembly may adjust to accommodate different size openings in a flange.

3,909,012
GAS SEALING ASSEMBLY

Louis H. Denis, Paris, France, assignor to Compagnie Francaise d'Etudes et de Construction "Technip", Rueil-Malmaison, France

Filed Mar. 14, 1974, Ser. No. 451,367
Claims priority, application France, Mar. 14, 1973, 73.09121
Int. Cl. F16j 15/40
U.S. Cl. 277—15 5 Claims



1. In a machine for handling gas including a stationary body, with a higher-pressure side and a lower-pressure side, a shaft extending through the body, and a respective bearing supporting the shaft at each side, each bearing being arranged at a spacing from the body, a sealing assembly comprising: a respective casing at each of the higher-pressure and lower-pressure sides of the machine and fixed with respect to the station-

ary body, each casing enclosing a portion of the shaft between the body and the respective bearing and each casing having annular chambers which are open towards the respective shaft portion, including a first chamber, a second chamber which is disposed between the first chamber and the respective bearing, a third chamber between the first and second chambers, a fourth chamber between the second chamber and the respective bearing, the casing at the higher-pressure side of the machine also including a fifth chamber between the first chamber and the body of the machine; means for introducing a barrier-action gas under pressure into the first chambers; means for introducing an inert gas under pressure into the second chambers; means connected to the third chambers for producing therein a pressure which is lower than the pressure in the first and second chambers; a conduit connected to the fourth chambers and open for discharge at a position remote from the machine; and means for introducing into the fifth chamber gas being handled by the machine, from the lower-pressure side of the machine.

3,909,013

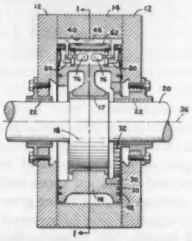
COUNTERWEIGHTED APEX SEAL FOR ROTARY ENGINES

Vasant R. Kumar, Paterson, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed June 5, 1974, Ser. No. 476,653

Int. Cl.[2] F16J *15/42*

U.S. Cl. 277—25 **3 Claims**



1. Counterweighted apex seal means for a rotary mechanism including a housing having an internal cavity with the peripheral surface of said cavity having a multi-lobe profile which is basically an epitrochoid, a shaft coaxial with said epitrochoidal peripheral surface and having a cylindrical eccentric portion disposed within said cavity and a rotor member having a plurality of apex portions and being journaled on said eccentric portion for planetary rotation within said cavity about the axis of said shaft such that said apex portions generate an epitrochoidal surface so as to have sealing cooperation with the epitrochoidal peripheral surface of said cavity, said counterweighted apex seal means comprising:

a. seal strip means carried by the rotor member at each of its apex portions adjacent to the rotor member periphery in a manner so that the seal strip means can move radially relative to the rotor for sealing cooperation with said housing epitrochoidal peripheral surface;

b. counterweight means carried by the rotor member radially inwardly of each of said seal strip means;

c. additional weight means connected to each said seal strip means and disposed radially inwardly of its associated seal strip means with the center of mass of said additional weight means being disposed radially inwardly of the center of mass of said counterweight means; and

d. lever means for each seal strip means, each said lever means being pivotally supported by the rotor member and having a first portion connected to its seal strip means and having a second portion connected to the associated counterweight means such that the turning moment exerted on the lever means by the centrifugal force acting on the counterweight means during rotor member rotation is at all times opposed by the turning moment exerted on the lever means by the centrifugal force acting on the combined seal strip means and additional weight means and such that when the rotor member is at rest said turning moments are substantially equal and opposite.

3,909,014

SEAL

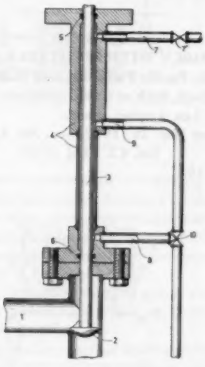
Willi Loliger, Konolfingen, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Oct. 16, 1973, Ser. No. 406,816

Claims priority, application Switzerland, Oct. 30, 1972, 15794/72

Int. Cl.[2] B65D *53/06;* **F16J** *15/40*

U.S. Cl. 277—72 R **4 Claims**



1. In combination with a reciprocable movable part, a seal for the passage of said reciprocable movable part into a germ-free enclosure, said seal comprising a sleeve surrounding said movable part, and seal means between said movable part and said sleeve for preventing escape of gas from the ends of said sleeve, said sleeve being provided at its farthest end from said enclosure with a gaseous fluid inlet, at its nearest end from said enclosure with an outlet and between said inlet and said outlet with a by-pass outlet, said inlet, outlet and by-pass outlet each being provided with a valve, said by-pass outlet valve being open during normal running when said outlet valve is closed and in which the distance between said gaseous fluid inlet and said by-pass outlet and the distance between said by-pass outlet and said outlet each is greater than the stroke of said movable part.

3,909,015

RING SEAL ASSEMBLY FOR A ROTARY PISTON INTERNAL COMBUSTION ENGINE

Gozo Kasahara, Urawa, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed July 9, 1974, Ser. No. 486,851

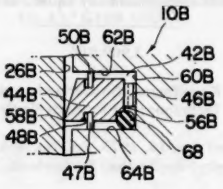
Claims priority, application Japan, July 12, 1973, 48-83165

Int. Cl.[2] F16J *15/38*

U.S. Cl. 277—81 P **9 Claims**

1. A ring seal assembly in a rotary piston internal combustion engine having a rotor formed with a ring groove in an end face thereof, comprising: a seal ring received in the ring groove and urged out of the ring groove, and a plurality of auxiliary seals disposed between the ring groove and the seal ring to render the ring groove fluid tight, the first of the auxiliary seals being disposed between an inner axially extending

radial surface of the seal ring and an inner axially extending radial surface of the ring groove, the second of the auxiliary seals being disposed between an outer axially extending radial



surface of the seal ring and an outer axially extending radial surface of the ring groove, in which said second auxiliary seal is a metal annular seal.

3,909,016

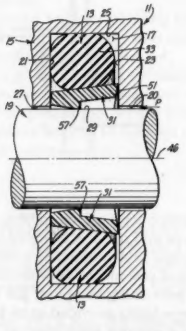
SEAL ASSEMBLY WITH PIVOTABLE SLIPPER SEAL

Henry A. Traub, Pacific Palisades, and Isiah Sherman Gauley, Westlake Village, both of Calif., assignors to W. S. Shamban & Co., West Los Angeles, Calif.

Filed Dec. 26, 1973, Ser. No. 427,937

Int. Cl. F16j *15/24*

U.S. Cl. 277—165 **13 Claims**



1. A seal assembly for use between inner and outer relatively movable members wherein the seal assembly is subjected to fluid under first and second fluid pressure levels which act in a first direction against the seal assembly, said first pressure level being less than said second pressure level, said seal assembly comprising:

a slipper seal adapted to circumscribe a region of the inner member and including an annular rib and an axially extending flange integral with said rib;

said rib having a peripheral sealing surface and said flange having first and second peripheral surface sections spaced radially from the peripheral sealing surface in a relaxed condition of said slipper seal;

said rib having an annular suffface which is generally transverse to the axis of said peripheral sealing surface, said annular surface extending generally between said peripheral sealing surface and said first peripheral surface section, said annular surface and said peripheral sealing surface defining an annular corner of said rib;

said slipper seal being pivotable generally about said corner between a high pressure position in which a first section of the peripheral sealing surface is engageable with the inner member along at least a portion of the length of said first section and a low pressure position in which the first section is engageable with the inner member along a lesser portion of the length of said first section and said corner is converted into a relatively narrow sealing ridge which is sealingly engageable with the inner member;

a resilient member spaced radially outwardly from said inner member by said slipper seal and at least partially circumscribing the inner member and contacting the second peripheral surface which is spaced from said inner member, said resilient member being squeezable radially between the second peripheral surface and the other of said members to apply a resultant static force to said slipper seal which tends to pivot said slipper seal to the low pressure position; and

the exposure of the seal assembly to said second fluid pressure level providing a resultant dynamic force which acts against said slipper seal to pivot the slipper seal to the low pressure position.

3,909,017

SEALING DEVICE

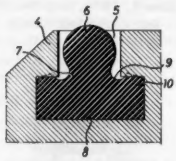
Hans B. Engstrom, Skarholmen, Sweden, assignor to AB Mecman, Sweden

Filed Nov. 27, 1973, Ser. No. 419,278

Claims priority, application Sweden, Dec. 6, 1973, 15913/72

Int. Cl.² F16J *15/18*

U.S. Cl. 277—168 **2 Claims**



1. A sealing device comprising:

a peripheral groove in a cylindrical surface, said groove having a reversed T-shaped cross section with an undercut groove portion and an outer groove portion; and

a sealing ring of elastic material inserted in said groove, said sealing ring having its cross section composed of a rounded head portion extending slightly outside said groove to seal against an opposite cylindrical surface and dimensioned to be spaced at all portions thereof from opposite walls of said outer groove portion, an essentially wider and approximately rectangular base portion dimensioned to closely fit in said undercut groove portion, a neck portion narrower than said head portion connecting said head portion symmetrically to one side of said base portion, and a peripheral chute formed in said base portion of said ring closely adjacent each side of the central neck portion, said chutes having outer walls formed by raised beads on said base portion designed to be compressed in said undercut groove portion.

3,909,018

SEALING JOINT FOR PIPES

Jacques Chaplain, Sevres, France, assignor to Societe Industrielle Gaillon-Armoryl "ARMOSIG", La-Celle-Saint-Cloud, France

Filed June 11, 1973, Ser. No. 368,464

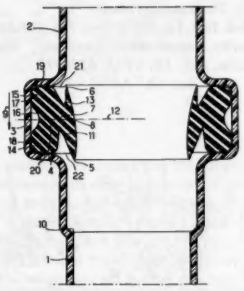
Claims priority, application France, June 19, 1972, 72.21994

Int. Cl.² F16J *15/32*

U.S. Cl. 277—206 A **10 Claims**

1. An annular sealing joint adapted to be seated in an annular groove within a hollow female pipe member for establishing a sealing connection with an inserted portion of a male pipe member comprising an outer annular base portion dimensioned to be received within said annular groove, an upstream lip and a downstream lip extending axially in oppo-

site directions from an inner portion of said base member with the ends of said lips spaced radially from the base portion, the inner surface of the upstream lip tapering gradually from an internal diameter at the upstream end which is greater than the diameter to an internal diameter which is less than the diameter of the male member beyond the upstream end, the inner surface of the downstream lip having a diameter throughout its length which is less than the diameter of the male member, in which the outer annular base portion is of a



cross-section in an axial half plane in the shape of a kidney bean with the concave portion facing outwardly and the convex portion facing inwardly and in which the lips are joined to the convex portion forming the back of the kidney bean shaped in cross-section and in which the upstream lip extends upstream in the direction of the insertion of the male end of the pipe member to be inserted and is frustoconical in cross-section with the small base downstream, while the downstream lip extends downstream and is of conical shape differing from that of the upstream lip.

3,909,019

GASKETS

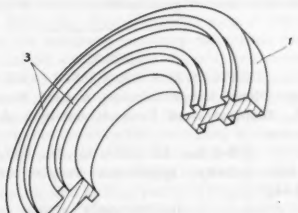
Toma D. Leko, c/o Portner, 12507 Davan Dr., Silver Spring, Md. 20904

Filed May 25, 1973, Ser. No. 356,896

Claims priority, application Germany, June 14, 1972, 2228933; Sept. 27, 1972, 2247372

Int. Cl. F02f *11/00*

U.S. Cl. 277—209 **3 Claims**



1. A gasket comprising ribbed metal plates in the form of an opening to be sealed, the ribs on said ribbed metal plates extending curvilinearly along both faces thereof, said ribs on one face being in staggered relation to the ribs on the opposite face, and flat metal plates having no ribs on either face thereof, said ribbed metal plates being stacked in said opening with a different one of said flat metal plates being disposed intermediate each pair them and in contact relationship there with, and a grommet embracing the peripheral margin of the gasket surrounding said opening to be sealed.

3,909,020

APPARATUS FOR AUTOMATICALLY CONTROLLING THE SIZE OF THE OPENING OF THE JAWS OF A CHUCK

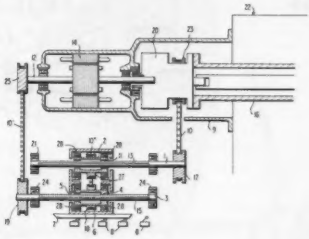
Kenji Yamano, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 7, 1974, Ser. No. 495,466

Claims priority, application Japan, Aug. 8, 1973, 48-93330

Int. Cl. B23b *31/28*

U.S. Cl. 279—1 H **3 Claims**



1. A system for automatically controlling the size of the opening of the jaws of a chuck having a rotatable main shaft, a motor having a shaft connected to said main shaft for rotation therewith and connected to means associated with said main shaft for controlling the size of the opening of the jaws of the chuck, said system comprising:

a first shaft mounted for rotation about its axis and being mechanically connected to said main shaft for rotation synchronously therewith,

an externally threaded, second shaft mounted for rotation about its axis and being operatively coupled with said motor shaft and being driven thereby,

a casing having a limit switch dog secured thereto and rotatably supporting therein, first and second bushings,

said first bushing being splined to said first shaft for rotation therewith, but movable axially thereof,

said second bushing being threadably engaged with said second shaft and being movable with said casing in the axial direction of said first and second shafts,

means coupling said bushings such that said bushings rotate in synchronism; and

at least one limit switch for operating said motor and mounted in the path of movement of said limit switch dog to stop the motor and thereby control the size of the opening of the jaws of said chuck upon movement of said limit switch dog into contact therewith.

3,909,021

COLLET CHUCK

London T. Morawski, Mount Clemens, and John J. Parker, Birmingham, both of Mich., assignors to MP Tool & Engineering Co., Warren, Mich., by said Parker

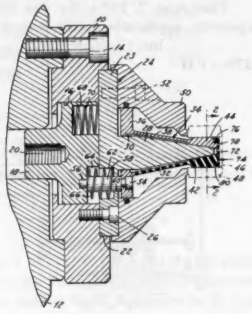
Filed Jan. 14, 1974, Ser. No. 433,135

Int. Cl.² B23B *31/40*

U.S. Cl. 279—2 R **7 Claims**

1. A collet chuck comprising, a sleeve having an open end and having adjacent said end a work-gripping outer surface portion of cylindrical shape concentric with the axis of the sleeve, said sleeve having a plurality of axial slots therein extending to the open end of the sleeve and defining a plurality of circumferentially arranged spring fingers which, when flexed radially outwardly, are adapted to increase the effective diameter of said work-gripping portion for engaging the bore of a workpiece, said slots being filled with an elastomer, said sleeve having a conical inner surface portion axially adjacent

said work-gripping portion, a collet expander within said sleeve having an outer conical surface portion interfitting with the inner conical surface portion of said sleeve whereby, when said sleeve and expander are shifted axially relative to one another, said spring fingers are flexed radially to engage and disengage with the bore of a workpiece circumscribing said work-gripping portion, and a cap member formed of an elastomeric material mounted on said end of said sleeve and overlying said opening in said end of the sleeve to prevent the ingress of dirt, chips and the like into said sleeve through the open end thereof, said cap having an axially extending annular flange circumferentially circumscribing the outer peripheral portion of said sleeve and frictionally engaged therewith so as to be adapted to be readily removed and replaced.

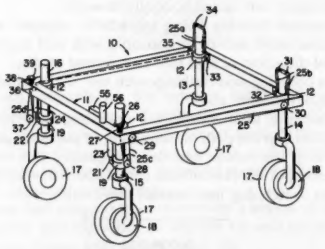


3,909,022

CABLE SUSPENSION FOR HARVESTING MACHINE

Gerald L. Claxton, Lafayette, Calif., assignor to Upright, Inc., Berkeley, Calif.

Filed Aug. 3, 1973, Ser. No. 385,456
Int. Cl.[2] B60S 9/12
U.S. Cl. 280—6 H **21 Claims**



1. A supported frame and leveling apparatus therefor comprising:

a. a rigid frame,

b. first and second ground-engaging supports mounted at one end of said frame for individual and independent vertical movement relative thereto;

c. first and second variable-length members connected between and supporting said frame on said first and second supports respectively;

d. means interconnecting said first and second variable-length members for equally and oppositely changing the length of one of said members in response to a change in the length of the other of said members;

e. third and fourth ground-engaging supports mounted at the other end of said frame for individual and independent vertical movement relative thereto;

f. third and fourth variable-length members connected between and supporting said frame on said third and fourth support members;

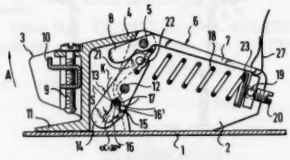
g. means including a first control means therefor for actuating at least one of said third and fourth variable-length members to change the length thereof.

3,909,023

SAFETY SKI BINDING

Reinhold Zoor, Dachau, Germany, assignor to Heinrich Wunder, KG, Dachau, Germany

Filed July 12, 1974, Ser. No. 488,004
Claims priority, application Germany, Mar. 8, 1974, 2411163; Austria, July 16, 1973, 6229/73
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—11.35 T **10 Claims**



1. A safety ski binding, conprising, in combination:

a. a housing adapted to be affixed to a base plate;

b. means defining a first pivotal axis, attached to said housing and extending transversely to the longitudinal direction of said housing;

c. a sole hold-soen device mounted for movement about the first pivotal axis, and including a laterally protruding pin; and

d. a release mechanism including means defining a second pivotal axis, attached to said housing substantially parallel to and below said first pivotal axis, a pivot tab means mounted for movement about said second pivotal axis, said tab including two lever arms, one of which contains an opening, and a spring, pivotably mounted on said housng, one end of said spring engaging one of said lever arms so as to form a knee-joint and the opening within the other of said lever arms being engaged by said laterally protruding pin;

whereby said sole hold-down device can move between two spring-loaded, stable angular positions, corresponding to an open and a closed condition of the release mechanism.

3,909,024

DEVICES FOR BRAKING LOOSE SKIS

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

Filed Jan. 15, 1974, Ser. No. 433,596
Claims priority, application France, Jan. 16, 1973, 73.01440
Int. Cl.[2] A63C 7/10
U.S. Cl. 280—11.13 B **17 Claims**

2. In combination with a releasable safety binding for ski boot on a ski, a braking device for ski, said safety binding comprising:

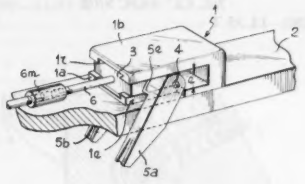
longitudinally sliding means responsive to disengagement of said ski boot in said ski, said braking device comprising:

at least one braking blade mounted in a movable manner with respect to said ski between two positions which include:

a first skiing position where said braking blade extends above the snow-gliding face of said ski,

a second braking position where said braking blade extends below the snow-gliding face of said ski to penetrate into the snow;

control means for controlling the movement of said braking blade, actuated by an elastic member which expands after release of said ski boot;



connecting means interconnecting the longitudinally sliding means responsive to disengagement of said ski boot and the control means; the longitudinally sliding means responsive to disengagement of said boot causing, through the connecting means, the movement of the control means whereby said braking blade moves into said braking position when said ski boot is released from the safety binding.

3,909,025

RELEASABLE SKI BINDING

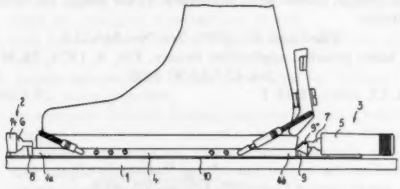
Ulrich Gertsch, Matten, and Ernst Gertsch, Wengen, both of Switzerland, assignors to Gertsch AG, Interlaken, Switzerland

Filed Apr. 23, 1973, Ser. No. 353,329

Claims priority, application Switzerland, May 10, 1972, 6998/72; May 12, 1972, 7029/72

Int. Cl.² A63C *9/08*

U.S. Cl. 280—11.35 K **7 Claims**



1. A releasable ski binding comprising a release plate having opposed ends, anchoring means incorporating a respective locking element for releasably retaining the release plate at each opposed end on an associated ski, plug pin means for retaining the release plate against movement in lengthwise direction of the ski, said plug pin means constituting the sole means for restraining movement of the release plate in the lengthwise direction of the ski while permitting upward movement of the release plate in a direction away from the ski, at least one of the locking elements being subjected to the loading action of a spring, said locking elements engaging in direct contact with and over the release plate and releasably retaining the release plate against upward movement with respect to the ski, said locking elements engaging only in an overlying position on the release plate such that said locking elements can freely move in the lengthwise direction of the ski independently of and without being obstructed by the release plate, said locking elements thus failing to exert any restraining action on the release plate against movement thereof in the lengthwise direction of the ski, and at least said spring-loaded locking element releasably retaining the release plate against lateral pivoting movement about said plug pin means, whereby during through-bending of the ski the locking elements are capable of shifting in the lengthwise direction with respect to the release plate.

3,909,026

RELEASABLE SAFETY DEVICE FOR A SKI BOOT

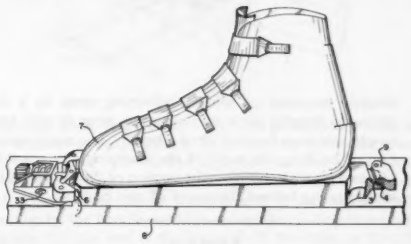
Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

Filed Feb. 22, 1974, Ser. No. 444,960

Claims priority, application France, Feb. 23, 1973, 73.06491

Int. Cl.² A63C *9/08*

U.S. Cl. 280—11.35 T **4 Claims**



1. A releasable safety fixing device for a ski boot comprising:

first holding means for holding one of the extremities of said boot, said first holding means including:

first retaining means consisting of an abutment mounted to a ski, said first abutment having a first ramp;

a second ramp mounted to said boot extremity and co-operating with said first ramp;

second holding means for holding the other extremity of said boot including second retaining means co-operating with said other boot extremity;

resilient means received in at least one of said holding means; said first and second ramps being slidable relative to one another, when subjected to a vertical force, along an axis corresponding substantially to the axis of said ski and against the opposing action of said resilient means;

release means interposed between said resilient means and one of said holding means for disengaging said resilient means from said one holding means and from said boot extremity associated with said one holding means when said first and second ramps have slid one relative to the other a distance less than the maximum travel of said ramps.

3,909,027

SAFETY STRAP FOR A SKI BOOT

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

Filed Mar. 18, 1974, Ser. No. 451,991

Claims priority, application France, Mar. 23, 1973, 73.10495

Int. Cl.² A63C *9/08, 11/00*

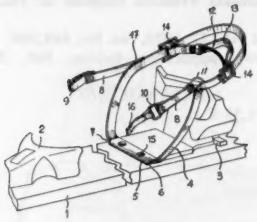
U.S. Cl. 280—11.35 N **12 Claims**

1. A safety-strap device intended to keep a ski boot attached to a ski after the release of a safety boot fixing device, said strap device comprising two distinct straps:

a continuous loop-forming strap mounted on said ski in at least two points located on each side of said ski, in front of the zone reserved for the heel of the boot sole and passing behind the upper of said boot;

and a clamping strap comprising two parts and a hooked closure device adapted to close the two parts over the front portion of the upper of said boot, one of the parts

of said clamping strap being mounted to said loop-forming strap; one of said straps comprising an elastic member attached at two points along said one strap to provide sufficient slack in the safety device to ensure that said boot can be disengaged after the release of said safety fixing device; the other part of said clamping strap being



slidably mounted on said loop-forming strap by a ring means to thereby allow said clamping strap to slide relative to said loop-forming strap whereby, in a single operation of hooking the parts of the clamping strap, a skier lifts and places in position the portion of the loop-forming strap passing behind the upper of said boot.

3,909,028

KNEE TWIST SENSING SKI BINDING

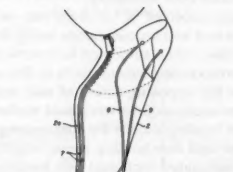
Guy Courvoisier, Geneva; Pierre Comte, Troinex, and Gerard Chevrolet, Damphreux, Bern, all of Switzerland, assignors to F. Salomon & Fils, Annecy, France

Filed Sept. 3, 1974, Ser. No. 502,728

Claims priority, application Switzerland, Sept. 3, 1973, 12583/73

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 D **10 Claims**



1. A safety ski binding comprising:

a ski boot adapted to receive the foot of a skier;

latch means for releasably securing said boot to a ski;

a sensor means having one portion carried at the knee region of said skier and another portion carried at the foot region of said skier adapted to sense relative movement of the two said portions; and

operating means connected between said sensor means and said latch means for operating same and releasing said boot from said ski when said knee and foot regions are angularly offset to each other about an axis passing through said regions to an extent exceeding a predetermined limit.

3,909,029

PROCESS FOR SAFETY RELEASE OF A SKI BOOT AND BINDING FOR CARRYING SAID PROCESS

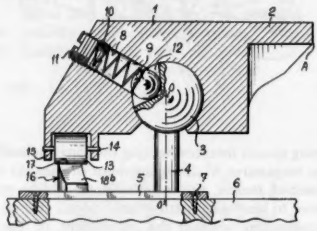
Georges Pierre Joseph Salomon, 34 Avenue de Loverchy, Annecy, France

Filed Oct. 21, 1974, Ser. No. 516,422

Claims priority, application France, Oct. 23, 1973, 73.37729

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 T **15 Claims**



1. A method for freeing a ski boot, in the event of a safety release, from the ski on which it is held by means of a safety binding, said method consisting in: forcing the boot initially to move parallel with the plane of the ski without any possibility of lifting, and subsequently allowing it to lift in relation to the ski, characterized in that in the course of the second phase of the release of the boot, the lifting movement thereof is braked resiliently and thus takes place progressively, whereas the ability to move laterally is retained until the release has been completed.

3,909,030

SKI BINDING

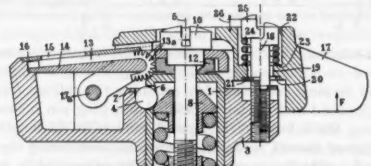
Jean Joseph Alfred Beyl, Boulevard Victor Hugo, 58 Nevers, France

Filed Jan. 27, 1975, Ser. No. 544,114

Claims priority, application France, Feb. 4, 1974, 74.3615

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 T **7 Claims**

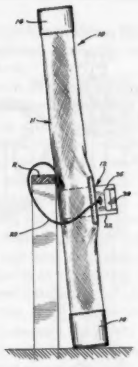


1. A safety ski binding device comprising in combination a main body, means for clamping the sole or heel of the ski boot so as to hold same in the vertical direction, said means being mounted for vertical movement on said main body, an adjustment member for modifying at will the position of said clamping means in the vertical direction, bearing means for providing bearing surfaces in the downward direction for said clamping means, a resilient element acting in the opposite direction on said clamping means in order to urge same downwards, and position indicator means for indicating any relative upward movement of said clamping means in relation to the body of said binding device against the force of said resilient element.

3,909,031
SKI HOLDER

Ruth H. Schmaedeke; Wayne W. Schmaedeke, both of 6712 Limerick Ln., Edina, Minn. 55436; Gloria J. Ericson, and Lennart A. Ericson, both of 5057 Nine Mile Creek Cir., Bloomington, Minn. 55431

Filed June 14, 1973, Ser. No. 369,960
Int. Cl.[2] A63C *11/00*
U.S. Cl. 280—11.37 K 1 Claim



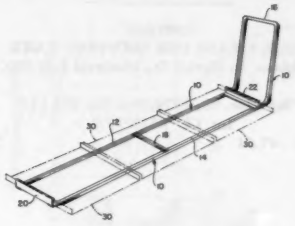
1. In a ski holder,
a. a pair of clamping members hingedly interconnected to each other for closing movement around the medial portion of a pair of skis which are disposed bottom to bottom,
b. said clamping members each having a handle plate disposed on the end remote from the hinge axis with said handle plates adapted to come into flush engagement when the clamping members are closed,
c. said handle plates having aligned hand receiving apertures,
d. means independent of said apertures for locking the handle plates together,
e. an elongated flexible binding member of metal material adapted to be secured around a ski rack or the like and having one end attached to a clamping member, and
f. said handle plates being provided with a second set of apertures which are aligned when said handle plates are together and the other end of said binding member having a loop adapted to be inserted through said second set of apertures and locked therein to provide means for locking the handle plates together.

3,909,032
DOLLY SCOOPER HAND BRACKET

James D. Wilson, Newport Beach, Calif., assignor to Banner Metals Division Intercole Automation, Inc., Compton, Calif.

Filed June 21, 1974, Ser. No. 481,518
Int. Cl.[2] B62B *3/04*
U.S. Cl. 280—47.34 2 Claims

1. A hand bracket for intercoupling a train of aligned wheeled dollies, each of the dollies having a bottom raised up from the supporting surface and a plurality of caster-like wheels suspended from the bottom, said bracket comprising: a pair of spaced side runners adapted to be moved along the supporting surface under the bottoms of the dollies from one end of the train to the other; a first transverse hook-shaped member mounted on the forward end of the bracket and attached to and extending from one of the side runners to the other in position to engage the front end of the forward dolly in the train; a second transverse hook-shaped member mounted on the rear end of the bracket and attached to and extending from one of said side runners to the other in position to engage the rear end of the last dolly in the train so that the runners of the hand bracket may be supported by the dollies up from the supporting surface; and an upstanding handle at the rear end of the bracket to the rear of said second

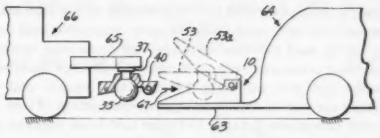


transverse hook-shaped member and in position to enable the side runners of the bracket to be pivoted by the handle about said rear end of said bracket to permit the first hook-shaped member to engage the front end of the first dolly in the train, and in position to enable the rear end of the bracket to be lifted up by the handle until the second hook-shaped member engages the rear end of the last dolly in the train, so that the hand bracket may form an intercoupling means for the dollies.

3,909,033
TRAILER HITCH

Wayne B. Russell, Jr., 3895 Lugo Ave., Lynwood, Calif. 90262

Filed May 17, 1974, Ser. No. 470,736
Int. Cl.[2] B60D *1/16*
U.S. Cl. 280—477 3 Claims



1. A trailer hitch for enabling a towing vehicle to tow a towed vehicle, comprising:
a base plate for attachment to one of the vehicles;
a ball mounted on a stem adapted to be attached in a depending attitude to the other of said vehicles;
said base plate having at its top surface a recess shaped to receive a lower part of the depending ball and
a ramp extending in a fore and aft and downwardly inclined direction from the rim of the recess to the end of the base plate nearest to said other vehicle;
said ramp having a lowest path in said fore and aft direction and having sides which extend upwardly from said lowest path;
a cover plate configured to cover at least part of the base plate and ramp;
the lower surface of said cover plate being recessed to enclose an upper part of the ball;
said cover plate having an opening communicating with its recess through which the stem may protrude;
said cover plate being suspended from the top of the ball when the ball is not engaged with the base plate, so that after the ball seats in the recess the cover plate can be fastened to the base plate;
said base plate having a ridge means at a position opposite the ramp and the cover plate having a convex portion which substantially conforms with, and covers, the ramp, and a lug portion at the opposite side of the cover plate

from the convex portion for engagement with said ridge means of the base plate;

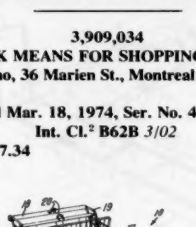
whereby when the two vehicles are moved into towing relationship with each other the ball slides up the inclined ramp between its sides and seats in the recess of the base plate after which the cover plate envelopes the upper part of the ball to hold it to the base plate.

3,909,034

HOOK MEANS FOR SHOPPING CART

Antoine Trubiano, 36 Marien St., Montreal East 550, Quebec, Canada

Filed Mar. 18, 1974, Ser. No. 452,114
Int. Cl.² B62B *3/02*
U.S. Cl. 280—47.34 **7 Claims**



1. A shopping cart comprising a frame supporting a container thereon, said frame being supported on casters for displacing said container; said container being defined by a bottom wall, side walls, a front and rear wall, and an open upper end; a handle consisting of a bar-like member supported rearwardly and above said container rear wall for displacing said cart on said wheels; and a hook member having a securable end, a projection arm and stop means at the free end of said projection arm; said hook member securable end being connected to said bar-like member and projecting inwardly towards said container rear wall whereby articles secured to said projection arm will hang between said handle and said container rear wall and from an uppermost portion of said cart to provide maximum distance between said hook member and the floor for hanging depending articles thereon.

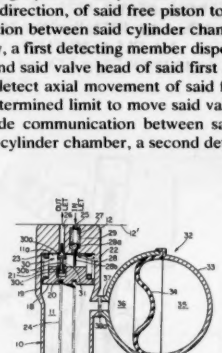
3,909,035

SUSPENSION UNIT FOR A MOTOR VEHICLE SHOCK ABSORBER

Hiroshi Aikawa, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Oct. 17, 1972, Ser. No. 298,447
Claims priority, application Japan, Oct. 23, 1971, 46-83667
Int. Cl. B60g *11/26*
U.S. Cl. 280—124 F **10 Claims**

1. A suspension unit for a vehicle, having a body structure and wheel supporting means, comprising a cylinder having formed therein a cylinder chamber filled with pressurized fluid, an inlet passageway opening into said cylinder chamber and communicating with a source of pressurized fluid and an outlet passageway opening into said cylinder chamber and communicating with a drain line, a piston axially slidable in said cylinder chamber, a piston rod connected to said piston and extending externally of said cylinder, a free piston axially slidably fitted in said cylinder chamber, between said piston and said inlet and outlet passageways opening into said cylinder chamber, and having formed therein a passageway providing fluid communication therethrough, a first control valve having a valve head for controlling fluid communication between said cylinder chamber and said inlet passageway, said valve head being operable responsive to the axial movement, in one direction, of said free piston to provide said fluid communication between said cylinder chamber and said inlet passageway, a second control valve having a valve head for controlling fluid communication between said cylinder chamber and said outlet passageway, said valve head of said second control valve being operable responsive to the axial movement, in another direction, of said free piston to provide said fluid communication between said cylinder chamber and said outlet passageway, a first detecting member disposed between said free piston and said valve head of said first control valve and operable to detect axial movement of said free piston in excess of a predetermined limit to move said valve head to a position to provide communication between said inlet passageway and said cylinder chamber, a second detecting member disposed between said free piston and said valve head of said second control valve and operable to detect axial movement of said free piston in excess of a predetermined limit to move said valve head to a position to provide communication between said outlet passageway and said cylinder chamber, a first preloaded spring disposed between an end wall of said cylinder chamber and said free piston to bias said free piston toward said piston, and a second preloaded spring disposed between said free piston and said piston to bias said free piston toward the end wall of said cylinder chamber, said first and second preloaded springs cooperating with each other to hold said free piston in a position in which said first and second detecting members are prevented from moving said valve heads of said first and second control valves, respectively.

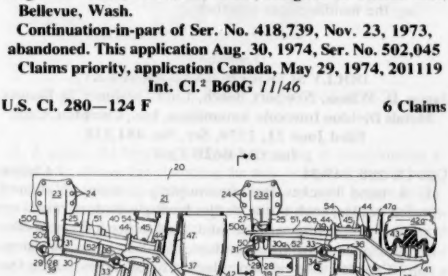


3,909,036

ROUGH DUTY AIR-SUSPENSION SYSTEM FOR TRUCKS AND THE LIKE

Virgil E. Pound, San Jose, Calif., assignor to Paccar Inc., Bellevue, Wash.

Continuation-in-part of Ser. No. 418,739, Nov. 23, 1973, abandoned. This application Aug. 30, 1974, Ser. No. 502,045
Claims priority, application Canada, May 29, 1974, 201119
Int. Cl.² B60G *11/46*
U.S. Cl. 280—124 F **6 Claims**

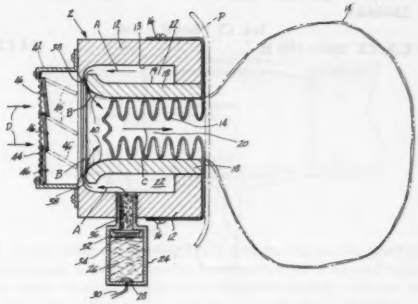


1. A rough duty air-suspension system for trucks and the like, including in combination:

a main frame for said truck;
an axle housing positioned under said frame and transversely thereto and having two axle ends each adapted to mount a wheel;
an adjustable tracking rod pivotally mounted between said axle housing and the frame and aligned to maintain the lateral position of said axle housing relative to the frame;
a spring support bracket for each axle end secured to and depending from said frame at a spaced distance in front of said end and having a wear pad in a middle portion and two sidearms extending downwardly from the ends of said wear pad to a lower end of said bracket;
radius rod attachment means at the bottom of each said bracket;
a safety rebound member bridging the sidearms of each said bracket and mounted generally between said wear pad and said lower end;
a radius rod for each axle end having a forward end pivotally secured to said bracket at said radius rod attachment means and having a rear end;
a spring seat secured on top of each said axle end and generally aligned under said frame and having a radius rod attachment member to which the rear end of a said radius rod is pivotally mounted;
a tapered leaf spring for each said axle end having a front end portion extending through the sidearms of a said bracket with a top leaf engaging said wear pad and a bottom leaf adjacent to said safety rebound member, and having a back end extending to a said spring seat;
a safety catch at the front end of each said tapered leaf spring adapted to engage the safety rebound member and wear pad of the bracket mounting said spring in the event that the radius rod secured to said bracket should break;
a rigid air spring support member clamped to the back end of each said tapered leaf spring and to each said axle end by a said spring seat and extending axially therefrom away from said seat to form a unified suspension cantilever and providing an air spring rest;
an air spring for each axle end having one end secured to the frame and another end on a said rest and pneumatically connected in parallel with each other air spring and to a source of air pressure;
a height control valve means connected between said air pressure source and all said air springs for employing said air pressure to maintain a predetermined distance between the axle housing and main frame while the loading of said truck is varied;
a shock absorber adjacent to each said air spring and pivotally mounted to the member supporting said air spring and to the frame and aligned to compress generally along the locus of movement of said cantilever.

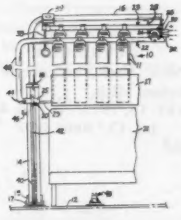
3,909,037
SAFETY DEVICE WITH COANDA EFFECT
Ben A. Stewart, Baraboo, Wis., assignor to Olin Corporation, New Haven, Conn.
Filed May 22, 1974, Ser. No. 472,392
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—150 AB **6 Claims**

1. An air bag inflation system for use in protecting vehicle passengers against injury in a collision, said system comprising:
a. means providing a source of pressurized primary fluid;
b. an ambient air aspirator including:
i. means forming a tubular throat having an upstream end for the induction of ambient air, and a downstream end for the expulsion of a mixture of ambient air and said primary fluid under pressure, said throat having said upstream end thereof formed with an air foil-shaped surface;
ii. means forming an annular chamber radially adjacent to said throat;
iii. means forming a slot opening from said annular chamber into said throat with said air foil-shaped surface forming one side of said slot;
c. means providing a fluid flow path between said source of primary fluid and said annular chamber; and



d. an inflatable air bag mounted adjacent said downstream end of said throat to receive said mixture of primary fluid and ambient air under pressure for inflation of said air bag.

3,909,038
VEHICLE SAFETY SYSTEM
Leo G. McDonnell, 19917 Kinloch, Detroit, Mich. 48240
Continuation-in-part of Ser. No. 320,991, Jan. 4, 1973, Pat. No. 3,832,000. This application Aug. 13, 1974, Ser. No. 496,962
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—150 B **15 Claims**



1. Improvement in a vehicle safety system employing vehicle safety means including safety curtain means having a latched safety curtain and a curtain gate therefor which gate is thrown from an elevated to a lowered position in a vehicle to achieve vehicle safety for an occupant of a seat in said vehicle, said safety curtain being a full body curtain, said improvement comprising a construction for said gate providing a cross-piece therefor which is offset from its ends, means for attaching the bottom of said curtain to said cross-piece, means for pulling the ends of said gate and guiding the same in a straight downward path, and means for rotating the gate during its downward travel so that the cross-piece thereof and the bottom of said curtain swing over and clear of the head of the occupant.

3,909,039

SAFETY INSTALLATION FOR THE PASSENGERS OF VEHICLES, ESPECIALLY OF MOTOR VEHICLES

Bela Barenyi, Maichingen; Karl Wilfert, Gerlingen-Waldstadt, and Hermann Renner, Magstadt, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 4, 1973, Ser. No. 403,533

Claims priority, application Germany, Oct. 4, 1972, 2248645

Int. Cl.² B60R 21/02

U.S. Cl. 280—150 B 24 Claims

1. A safety installation for vehicle passengers comprising in combination

impact means arranged in spaced relationship in front of a vehicle passenger for absorbing impact of the passenger during an accident, said impact means being pivotally mounted about a vehicle cross axis to absorb said impact with only slight torque of said impact means about said cross axis such that only minimal pivot motion of said impact means occurs upon impact, and

catching-net means for additionally retaining said passenger, said catching-net means having an upper end secured within the area of the vehicle roof and having a lower end arranged such that said impact means brings said catching net means into an effective position in front of said passenger,

wherein said impact means are pivotally supported about said vehicle cross axis to be pivoted into position in front of said passenger during said accident, said catching net means being brought into said effective position by the pivoting of said impact means into position in front of said passenger.

3,909,040

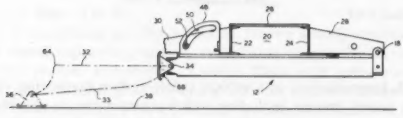
OUTRIGGER

Peter J. Visser, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Oct. 15, 1973, Ser. No. 406,749

Int. Cl.² B60S 9/02

U.S. Cl. 280—150.5 12 Claims



1. An outrigger for a machine having a frame, the outrigger comprising an inner elongated member, a connection adjacent one end of the said inner member pivotally connecting the inner member to the frame, an outer member housing the said inner member and movable outwardly and inwardly of the inner member, power means for selectively moving the said outer member outwardly and inwardly of the said inner member, and movable guide and support means interconnected between the said outer member and the frame and responsive to movement of the outer member for causing the outrigger to pivot away from the frame during outward movement of the said outer member.

3,909,041

REAR SEAT BELT ASSEMBLY

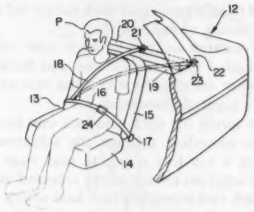
Hisakazu Murakami, Yokohama; Heigo Tsuji, Fujisawa, and Akira Kaneko, Kamakura, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 26, 1974, Ser. No. 445,953

Claims priority, application Japan, Feb. 27, 1973, 48-24961

Int. Cl.² B60R 21/10

U.S. Cl. 280—150 SB 3 Claims



1. An improvement to a vehicle body including rear side pillars, at least one rear seat, at least one lap belt having one end secured inboard of said rear seat to a relatively lower portion of said vehicle body and the other end secured outboard of said seat to the other relatively lower portion of said vehicle body, and at least one shoulder belt having one end fixed to said lap belt and the other end fixed to a relatively upper portion of said vehicle body behind said seat; the improvement being in that an elongated rigid member is connected at its both ends with said rear side pillars to form a rigid structure, and in that said the other end of said shoulder belt is connected to said elongated rigid member.

3,909,042

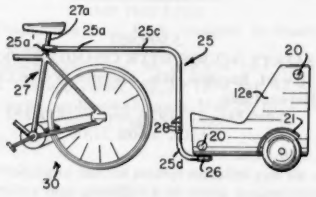
MOVABLE CARRYING STRUCTURE

Clyde A. Miller, 3327 Comanche Pl., Owensboro, Ky. 42301

Filed Dec. 21, 1973, Ser. No. 427,136

Int. Cl. B62k 27/12

U.S. Cl. 280—204 4 Claims

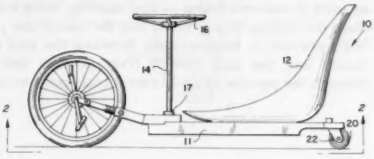


1. A carrying structure comprising, in combination, a vehicle having a framework and a wheel-mounted carrier, where an element extends between said vehicle and said carrier, one end of which pivotally secures to said framework of said vehicle and defines a vertical axis of movement of said vehicle and the other end of which rotatably mounts on said carrier and defines a lateral axis of movement of said vehicle with respect to said carrier.

3,909,043
THREE WHEEL VEHICLE

Marion Homer Black, 2900 W. Lincoln St., Apt. E 210, Anaheim, Calif. 92801

Filed Apr. 8, 1974, Ser. No. 458,912
Int. Cl. B62k 9/02, 11/00
U.S. Cl. 280—269 7 Claims



1. A three vehicle of high maneuverability and low center of gravity comprising:

a substantially horizontal chassis generally triangular in plan form,

a seat on said chassis facing toward a first corner of said chassis, said seat having a bottom, and means attaching said seat bottom to said chassis in close proximity thereto, a steering column at said first corner mounted for rotation on its own axis, a dirigible wheel at each said other corners of said chassis means including flexible tension means for connecting said wheels with said column for simultaneous steering movement upon rotation of said steering column,

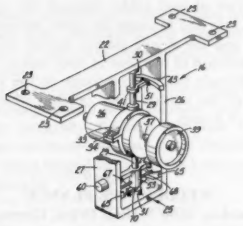
a non-dirigible driving wheel,

means for supporting said driving wheel at the said first corner of said chassis, forwardly thereof and having its axis above the level of said chassis and seat bottom, and means for rotating said driving wheel on its own axis.

3,909,044
TRAILER HITCH

George M. Henzel, 501 Henrich Dr., Kettering, Ohio 45429, and John H. Henzel, 10800 Elmwood, Cleveland, Ohio 44125

Filed Nov. 18, 1974, Ser. No. 524,559
Int. Cl.² B60T 7/20
U.S. Cl. 280—432 15 Claims

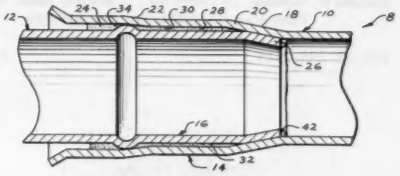


1. An apparatus mounted on the trailer of a tractor-trailer rig having a fifth-wheel hitching mechanism, for preventing undesirable trailer movements through timely application of a mechanical braking mechanism, comprising support means securely attached to said trailer, axle means rotatably mounted in said support means, gyroscopic means mounted on said axle means, first electrical contact means attached to said axle means, and second electrical contact means mounted on said support means whereby the relative positions of said first electrical contact means and said second electrical contact means result in electrical signals being applied to said mechanical braking mechanism.

3,909,045
TUBING JOINT FOR ADHESIVE BONDING

George L. Meagher, Morrisville, Pa., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 10, 1974, Ser. No. 513,838
Int. Cl.² F16L 13/00
U.S. Cl. 285—22 3 Claims



1. A tube joint comprising a first tube having an end portion receiving an adhesive coated end portion of a second tube with radial clearance between contiguous sealing surfaces of the two tubes providing a retaining area for said adhesive:

a first annular outwardly projecting flange on said first tube providing an enlarged cross-sectional area forming one of said sealing surfaces, and a second annular flange projecting outwardly relative to said first flange and spaced axially from said first flange providing a second enlarged cross-sectional area forming a guide surface;

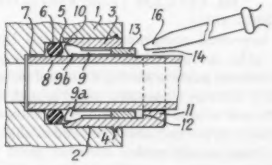
guide means on said second tube end portion projecting radially outwardly into said second enlarged cross-sectional area engaging and forcing said adhesive into said retaining area during telescoping of said members to eliminate voids in said adhesive, said guide means being in direct sealing engagement with said second flange thereby sealing one end of said retaining area; and

mating means on the free end of said second tube end portion being in direct sealing engagement with said first flange thereby sealing the other end of said retaining area.

3,909,046
CONNECTOR FOR FLUID CONDUITS, SUCH AS SEMI-RIGID PIPES

Andre Legris, St-Maur, France, assignor to Societe Legris France S.A., Ozoir-la-Ferriere, France

Filed Mar. 13, 1974, Ser. No. 450,680
Claims priority, application France, Apr. 24, 1973, 73.14831
Int. Cl.² F16L 55/00
U.S. Cl. 285—39 8 Claims



1. A releasable coupling device for a pipe, said coupling comprising a body having first, second, third and fourth concentric bores, a collar retained in said first bore and having an inner surface inclined to the axis of the bores, a clamping member disposed about a pipe and within the collar for axial movement relative thereto, said clamping member comprising a plurality of flexible jaws and means cooperating with the inclinded surface of the collar for driving the jaws inwardly to clamp the pipe upon relative movement between the collar and clamping member, means in the second bore for forming

a seal between the outer surface of the pipe and the wall of the second bore, said pipe being disposed in the first, second and third bores, and means fixed to the collar for guiding the pipe into the coupling having an abutment member for the end of the clamp.

3,909,047

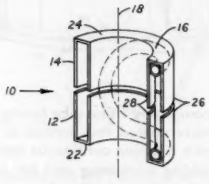
ROTARY ROLLING CONDUIT

Gordon O. Salmela, 29 Colby Rd., Braintree, Mass. 02185

Filed Mar. 11, 1974, Ser. No. 449,694

Int. Cl.[2] F16L *55/00*

U.S. Cl. 285—119 **8 Claims**



1. Flexible coupling apparatus comprising,

relatively rotatable first and second members

means defining a flexible conduit section for intercoupling said relatively rotatable first and second members,

means securing spaced portions of said conduit section to respective ones of said first and second members,

said first and second members having means defining confronting axially spaced annular channels for accommodating said flexible conduit section,

means including the means securing spaced portions of said conduit section and the means defining confronting axially spaced annular channels for mounting said flexible conduit section in said confronting axially spaced annular channels so that in one position of relative rotation of said channels said conduit section forms a generally C-shape and in another position of relative rotation of said channels said conduit section forms a generally L-shape,

the azimuth projections of said conduit section being of substantially constant arc length in all positions of relative angular displacement between said members.

3,909,048

END FITTING FOR FLEXIBLE PUMPING STRAND

Herbert E. Townsend, Jr., Coopersburg, and Frank Krcmar, Easton, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 3, 1974, Ser. No. 457,527

Int. Cl.[2] C23F *11/00;* **F16L** *13/14*

U.S. Cl. 285—169 **5 Claims**

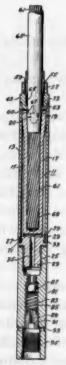
1. An improved compression type end fitting for plastic jacketed cables through which fluid mediums pass comprising:

a. a central body portion having a central bore extending in a longitudinal direction partially therethrough and adapted to receive the end of said cable in order to allow compression of said central body portion about the end of said cable to secure said end fitting to said cable;

b. a sleeve means surrounding said central body portion and spaced from said body portion at least in contiguous portions extending from a point extending on one end beyond said central body portion and on the other end abutting and sealingly secured to said body portion,

c. a sealing fitting means positioned at the end of said sleeve means extending beyond said central body portion arranged and constructed to effect a sealing relationship with both the surface of said cable and the sleeve means; and

d. a passage means positioned in the opposite end of said central body portion from said bore and extending from a location in the central body portion adjacent to which the sleeve means is spaced from said body portion to the terminal end of said end fitting, said passage means opening into the space between the said sleeve and the central body portion at one end and to the exterior of said end fitting at the opposite end and in part defining a portion of a continuous passage extending from a position adjacent an opening in the jacket of a plastic jacketed cable secured in said end fitting — said opening being intermediate the sealing fitting means and the end of the central body portion — longitudinally between the said sleeve means and the said central body portion, and then through the portion of said central body portion beyond



the end of said central bore in said central body portion to the end of the fitting,

said end fitting being so constructed and arranged that a fluid medium, passing into the upper portion of a plastic jacketed cable, secured in said end fitting, and flowing therethrough along and around the component wires of said cable, will flow from the interior of said cable, through the opening in the plastic jacket, into and through the space between the central body portion and the sleeve means, thence through passage means in the portion of the central body below the end of the central bore therein and therethrough to the exterior of the terminal end of the central body portion which extends beyond the sleeve means.

3,909,049

WELDED PIPE FLANGE

Joseph R. Blatnica, 1600 Walnut Drive, Chester, Va. 23831

Continuation of Ser. No. 367,891, June 7, 1973, abandoned. This application Jan. 16, 1975, Ser. No. 541,379

Int. Cl.[2] F16L *13/02*

U.S. Cl. 285—329 **4 Claims**

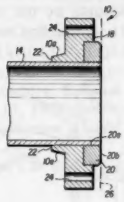
1. The combination comprising:

a carbon steel flange body having a smooth walled cylindrical opening therein through which a first pipe to be joined may be extended;

said body having an annular recess in the radial end face surrounding said opening; and,

an integral annular weld of non-corrosive metal deposited in an integral with said flange body at the surface of said recess to fill said recess and to extend axially beyond said face, said integral weld having an annular radial ma-

chined, smooth, pipe joint surface that is raised with respect to said face and a machined, smooth cylindrical



bore extending therethrough which is coaxial with said opening for receiving said first pipe to be joined.

3,909,050

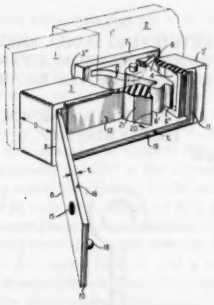
CABINET SAFETY LATCH

Anthony P. Vicendese, 50 Sutton Dr., and Frank Vicendese, 617 Plainfield Ave., both of Berkeley Heights, N.J. 07922

Filed Oct. 15, 1974, Ser. No. 514,381

Int. Cl.[2] E05C *19/10*

U.S. Cl. 292—128 **12 Claims**



1. A safety catch for locking together two members comprising

a hook member mountable to one of said members,

a main plastic body affixable to the other of said members and having an aperture therethrough for receiving said hook member,

said main body having a shoulder extending into said aperture for engaging said hook member and a flush fitting cover flap integrally die cast with said main body for hiding said aperture and said hook member from view, said flap being hinged to said main body by a thin plastic flashing section.

3,909,051

NARROW PROFILE DOOR LATCH

Ikuo Nakai, Hisai, Japan, assignor to Miwa Lock Company, Ltd., Tokyo, Japan

Filed Apr. 5, 1974, Ser. No. 458,071

Int. Cl.[2] E05C *1/16*

U.S. Cl. 292—166 **10 Claims**

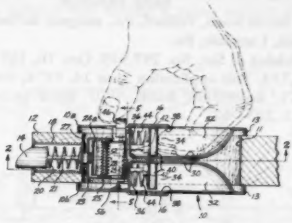
1. A door latch having a selectively retractable, normally extended bolt, comprising:

inner and outer housings respectively mounted within the inside and outside surfaces of the door, the exterior surfaces of the inner and outer housings being essentially faired, respectively, with the inside and outside surfaces of the door;

the inner housing defining an inner recess into which a hand or similar object is insertable, the recess opening transversely outwardly from the inside of the door;

an inner elongated pusher element positioned vertically within the inner recess and reciprocatively movable therein in a forward direction and in a reverse direction;

the outer housing defining an outer recess into which a hand or similar object is insertable, the outer recess opening transversely outwardly from the outside of the door;



an outer elongated pusher element positioned vertically within the outer recess and reciprocatively movable therein in a forward direction and in a reverse direction;

means connecting the inner and outer pusher elements with the bolt for retractively moving the bolt in response to forward movement of the pusher elements, said means permitting said bolt to advance to a door jam engaging position upon movement of said pusher elements in said reverse direction.

3,909,052

DOOR LATCHES

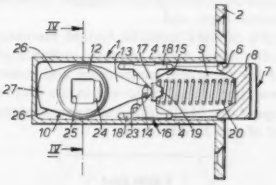
Michael Joseph James, Cheltenham, England, assignor to Micro & Precision Mouldings (Cheltenham Limited), Cheltenham, England

Filed July 16, 1973, Ser. No. 379,434

Claims priority, application United Kingdom, July 19, 1972, 33701/72

Int. Cl.[2] E05C *1/12*

U.S. Cl. 292—169 **9 Claims**



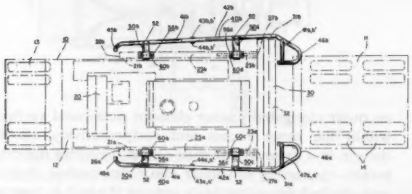
1. A mortice latch assembly comprising a tubular body and a subassembly insertable as a unit through one end of said tubular body, said subassembly comprising a slam bolt and a bolt spring and a follower and a rotary actuator, the bolt being slidable in the body between a forward projecting latching position and a rear retracted release position, the actuator seating on the body for angular movement transverse to the direction of bolt sliding movement, the bolt having side limbs that extend rearwardly from a front nose portion of the bolt, the follower being slidable in the body between the bolt limbs, the spring being disposed between the bolt limbs and acting in compression between the rear of the bolt nose and the front of the follower, the actuator, having an operating projection between the bolt limbs that engages with the bolt limbs to hold the subassembly together for fitting into the body, the bolt limbs having cam surfaces thereon that contact the actuator projection and that are inclined to the direction of bolt sliding

movement so that rotation of the actuator in one direction from a rest position moves the bolt rearwardly, the follower having a cam surface thereon that contacts the actuator projection and that is inclined to the direction of bolt sliding movement and oppositely inclined to the cam surfaces of the bolt limbs so that rotation of the actuator in said one direction from said rest position moves the follower forwardly.

3,909,053
SIDE FENDER

Terry David Koch, Telford, Pa., assignor to Inno-Cept Corporation, Lansdale, Pa.

Division of Ser. No. 297,949, Oct. 16, 1972, Pat. No. 3,866,733. This application June 24, 1974, Ser. No. 482,070
Int. Cl.² B60P *3/06;* **B60R** *19/02;* **B61F** *19/04;* **E02F** *9/24*
U.S. Cl. 293—62 **2 Claims**



1. Traffic protective device for reducing the risk of injury to motorists from a collision with a large bulldozer while in transit on an open-sided vehicle, said device comprising:

a. a pair of longitudinally-extended, rigid guard members of a length and configuration such that each is adapted, when separably attached to said bulldozer in a position generally parallel and adjacent to the exterior side of a blade-lifting arm member of said bulldozer, at one of its ends having an inclined hook shaped portion extending laterally with respect to the guard member and with lateral reinforcing means extending between the portions of the hook, to partially shield at least a portion of the adjacent vertical edge of the blade member of said bulldozer and at its other end at least to partially shield the adjacent extremity of said blade-lifting arm member, whereby another vehicle colliding with said open-sided vehicle will be deflected by said guard member away from said vertical edge; and

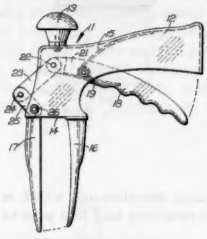
b. a plurality of rigid arm-like hanger members extending rearwardly from each of said guard members, and adapted for separably connecting and maintaining said guard member to said bulldozer in the aforesaid position with respect to a blade-lifting arm member and said blade member of said bulldozer.

3,909,054
WEED PULLER

Gilbert A. Lazzari, deceased, late of Redwood City, Calif., and Mary L. Lazzari, administratrix, 340 Arlington Rd., Redwood City, Calif. 94062

Filed Nov. 26, 1973, Ser. No. 419,080
Int. Cl.² A01B *1/18*
U.S. Cl. 294—50.9 **4 Claims**

1. A weed puller comprising a body consisting of a pair of side plates arranged in spaced relationship to one another and defining an elongated chamber, an elongated extension on each of said pair of said plates to define a handle for carrying and lifting said body, a first bolt spanning said side plates and secured thereto, a trigger lever fulcrumed on said first bolt, a second bolt extending transversely of said chamber parallel to said first bolt and arranged in spaced relation to said first bolt, a third bolt extending transversely of said chamber parallel to said second bolt and arranged in spaced relation to said first bolt and said second bolt, compound linkage comprising a series of toggle joints consisting of at least two links connected and between said first bolt and said second bolt and to an between said second bolt and said third bolt, a rigid first prong fixedly secured to said body, and a second prong secured to said third bolt and movable by the movement of the link connected to said third bolt; said first and second prongs being

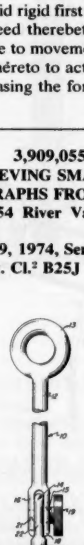


weed engageable while in the soil upon movement of said second prong toward said rigid first prong to break up the soil and to tightly grip a weed therebetween for lifting the same from the soil in response to movement of said trigger lever by manual force applied thereto to actuate said compound linkage progressively increasing the force applied to said trigger lever.

3,909,055
DEVICE FOR RETRIEVING SMALL SHEETS SUCH AS RADIOGRAPHS FROM A TANK

Richard M. Koppel, 554 River Vale Rd., River Vale, N.J. 07675

Filed May 29, 1974, Ser. No. 474,326
Int. Cl.² B25J *1/02*
U.S. Cl. 294—64 R **3 Claims**



1. A device for retrieving small sheets, such as radiographs, from a tank, said device comprising:

a handle;

a pair of opposed, spaced flat plates at the end of the handle to form a yoke;

an eye having a body portion and a threaded shank;

a suction cup having a threaded opening within which the threaded shank is engaged;

a protuberance extending from the eye toward one of the flat plates and normal to the surface of the body portion of the eye;

an opening in each of the pair of flat plates of the yoke;

the protuberance fitting in one of said openings to pivotally affix the suction cup to said end of the handle;

the other of said openings being threaded; and

screw means threaded into the other of said openings and juxtaposed with the eye such that as the screw means is

tightened, the eye is urged against a flat plate of the yoke to thereby hold the suction cup in a fixed position relative to the handle.

3,909,056
SHEET HANDLING EQUIPMENT

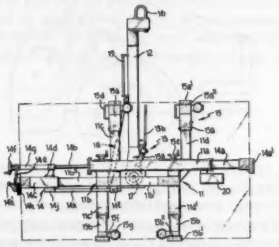
Robert Christian Duwe, The Hollies, Ford Lane, Northenden, Manchester 22, Lancashire, England

Filed Mar. 13, 1974, Ser. No. 450,568

Claims priority, application United Kingdom, Mar. 17, 1973, 12951/73

Int. Cl.[2] B66C *1/48*

U.S. Cl. 294—67 BB **22 Claims**



1. Sheet handling equipment for use in lifting a load consisting of a rigid sheet, or sheets, at a first position, whereat each said sheet is disposed in generally vertical manner on a first edge thereof, rotating the load and depositing the same at a second position on a second and different edge, the said equipment comprising a rigid framework, such framework defining a generally vertical support plane, a suspension arm connected with and adapted to support the said framework, the arm being generally parallel to the support plane and the framework being rotatable relative to the suspension arm, in a plane adjacent to such arm, about an axis generally at right angles to the support plane, a first abutment means on the said framework adapted for engagement with the sheet or sheets to be moved at the first edge thereof, and a second abutment means on the framework adapted for engagement with a second edge of the sheet, such second edge being adjacent the said first edge, the abutment means each including elements adapted for engagement with respective edges of the sheet; means for rotating said load in said support plane on said pivot axis in a predetermined angular direction under the influence of gravity, and the second abutment means lying, in relation to the first such means, on the same side of said pivot axis as said predetermined angular direction.

3,909,057
COMBINATION CAMPER AND BOAT TRAILER MECHANISM

Joe M. Guthry, 9306 Bintliff, Houston, Tex. 77036

Filed Oct. 29, 1973, Ser. No. 410,820

Int. Cl.[2] B60P *3/10, 3/34*

U.S. Cl. 296—23 B **17 Claims**

1. A boat and camper transporting mechanism, comprising:

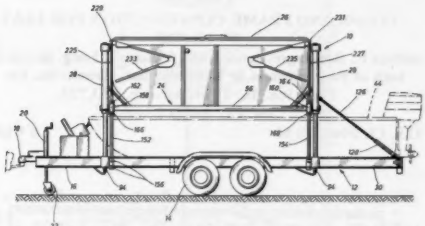
a trailer having a boat supporting framework and being adapted for launching of a boat into a body of water from the rear of the trailer, said trailer framework being positioned relative to the axles of the trailer wheels such that pivoting of a boat relative to the trailer framework is prevented during boat launching and retrieval operations;

a camper supporting framework being carried by said boat supporting framework;

a plurality of jack mechanisms being disposed one at each corner of said camper framework, said jack mechanisms each having a movable portion and a stationary portion, one of said movable and stationary portions being fixed to said camper framework and the other of said movable and stationary portions being fixed to said boat supporting framework, relative movement of said movable and stationary portions of said jack mechanisms raising and lowering said camper framework relative to said boat supporting framework;

means causing selective relative movement of said movable and stationary portions of said jack mechanisms; and

a camper assembly being carried by said camper supporting framework, said camper assembly comprising a generally rigid body portion and having a cover portion that is



elevatable relative to said body portion to render said camper assembly habitable, said camper supporting framework and camper assembly being positioned above said boat supporting framework by said jack mechanisms when a boat is to be located on said boat supporting framework said camper assembly and camper framework being positioned by said jack mechanisms in spaced relation above the boat for roadway traveling and being positioned in supported relation on said boat supported framework when a boat is not positioned on said boat supporting framework, said camper assembly being habitable in the raised and lowered positions thereof.

3,909,058
ENERGY-ABSORBING VEHICLE BODY END STRUCTURE

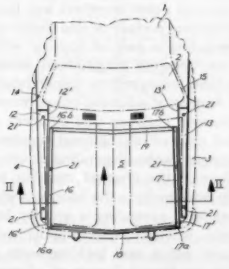
Friedhelm Krämer, Hochheim, and Klaus Brunk, Russelsheim (Main), both of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1973, Ser. No. 418,768

Claims priority, application Germany, Nov. 29, 1972, 2258290

Int. Cl. B62d *27/00*

U.S. Cl. 296—28 R **3 Claims**



1. In a vehicle body having a body compartment including an exterior opening and a pivoted exterior closure received within the body compartment opening, the combination comprising, spaced pairs of generally elongated energy absorbing members extending generally longitudinally of the body, the members each having a vertical face, one member of each pair being mounted on and in addition to the body compartment and the other member of the pair being mounted on and in

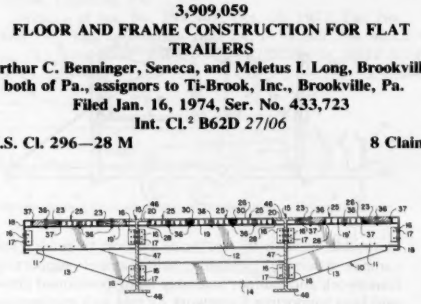
addition to the closure, with the vertical faces of the members located in adjacent laterally juxtaposed relationship, each pair of energy absorbing members and the closure and body compartment collapsing longitudinally of the body under longitudinal impact loads applied thereto, the vertical faces of the members deforming laterally of the body into wedging engagement with each other upon such collapse, the wedging engagement of the pairs of members laterally interlocking the closure and the body compartment and maintaining the closure within the body compartment opening.

3,909,059

FLOOR AND FRAME CONSTRUCTION FOR FLAT TRAILERS

Arthur C. Benninger, Seneca, and Meletus I. Long, Brookville, both of Pa., assignors to Ti-Brook, Inc., Brookville, Pa.

Filed Jan. 16, 1974, Ser. No. 433,723
Int. Cl.[2] B62D *27/06*
U.S. Cl. 296—28 M **8 Claims**



1. A floor construction for placement on the main frame of a load carrying vehicle, including:

A. a plurality of longitudinally extending panel members positioned in side-by-side, spaced apart relationship on said main frame, said panel members each having an upper load bearing surface disposed in parallel spaced relationship to the frame, each of said panel members also having a pair of leg portions downwardly extending on opposed longitudinal sides of the load bearing surface, each of said leg portions terminating in an outwardly extending lateral flange, said flanges having an upper bearing surface formed in parallel spaced relationship to the load bearing surface of the panel members and a lower bearing surface contacting the main frame of the vehicle, said lateral flanges also including an upwardly extending shoulder portion at the outermost edge of the upper bearing surface thereof;

B. a plurality of longitudinally extending channel members positioned between adjacent pairs of panel members, said channel members each having an upper surface extending between adjacent panel members and forming a portion of the load bearing surface of said floor and each channel member including a pair of locking webs downwardly extending on opposite longitudinal sides of the upper surface seatably engaging the upper bearing surfaces of the lateral flanges of adjacent panel members, whereby, lateral movement between said adjacent panel members is prevented, each of said channel members also includes a pair of support webs, depending downwardly from the upper surface of the channel member in spaced apart relationship intermediate the locking webs of said channel member, and extending a greater length than said locking webs, whereby, said support webs contact the vehicle frame when said locking webs are in bearing contact with the lateral flanges of adjacent panel members; and

C. fastening means extending through the upper surface of the panel members and the channel members for securing said members to the vehicle frame whereby longitudinal movement of said members is prevented, wherein the securement means includes a plurality of headed fasteners extending through the upper surface of said panel and channel members and lockably secured to the vehicle frame

3,909,060

COVER FOR THE STORAGE AREA OF AN AUTOMOBILE

Yutaka Katayama, Los Angeles, Calif., assignor to Yutaka Katayama, Los Angeles, Calif.

Filed May 3, 1974, Ser. No. 466,815
Int. Cl.[2] B60R *5/04*
U.S. Cl. 296—37 R **3 Claims**

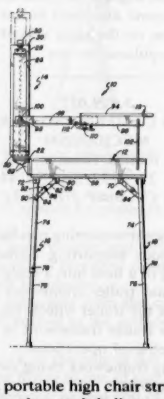
1. A cover for the storage area of an automobile having a lid for the storage area, said lid being hingedly mounted on the body of the automobile adjacent the inner edge of the lid, said cover comprising, a pair of elastic cord-like support members each having one end secured to the lid at points near the corners of the outer edge thereof and each support member having its other end secured to the interior of the automobile along the sides therein at the forward portion of the storage area, a sheet of flexible opaque material stretched between and supported by said support members, said sheet having an area sufficient to cover the major portion of the storage area when the lid is closed and said sheet moving upwardly with opening movement of the lid to expose said storage area when the lid is fully open.

3,909,061

PORTABLE COLLAPSIBLE HIGH CHAIR

Michael J. Johnson, 37 Highland Ter., Gloversville, N.Y. 12078

Filed Mar. 5, 1974, Ser. No. 448,307
Int. Cl.[2] A47C *4/00*
U.S. Cl. 297—17 **11 Claims**



1. A collapsible portable high chair structure comprising, in combination, first and second shallow open topped box members each including a generally rectangular bottom panel and side walls mounted on and extending upwardly from the side edges of the bottom panel, hinge means joining said boxes

together along one side edge adjacent the open tops thereof for movement between a closed position in side-by-side relation with the two open tops overlying one another and an open position extending at substantially right angles to one another, a first closure panel hingedly mounted on said first box for closing the open top thereof and defining a seating surface, said first closure panel and said first box cooperating to define a seat assembly having a storage compartment under the seating surface, a second closure panel hingedly mounted on said second box and defining a backrest surface for the chair, said second tray and said second closure panel cooperating to define a chair back assembly having a storage compartment therein, a removable tray, means mounting said tray on said back assembly and said seat assembly, said tray being adapted to be stored in one of said storage compartments, and foldable legs mounted on said seat assembly for movement between a collapsed position lying along said seat assembly and an erected position projecting downwardly from the corners thereof.

3,909,062

SELF-TIGHTENING TOOL CHUCK WITH A STOP MEMBER ADAPTED TO BE AXIALLY DISPLACED BY MEANS OF SCREWS

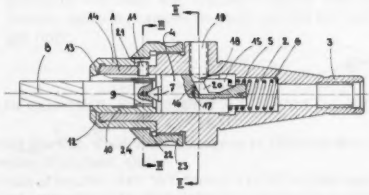
Edmo Benatti, Bancole, Italy, assignor to Firma Franken Fabrik fur Prazisionswerkzeuge, und Prazisionsteile Richard Voigt Nachf, Ruckersdorf, Germany

Filed Feb. 5, 1974, Ser. No. 439,942

Claims priority, application Germany, Feb. 7, 1973, 2305768

Int. Cl.[2] B23B *31/20*

U.S. Cl. 279—47 **5 Claims**



1. In a self-adjusting tool chuck comprising a chuck member having means on one end adapted to be coaxially secured to a machine spindle, and an axial bore at the other end, a tool housing being axially slidably supported in said bore and having an internal threaded portion for receiving a tool, a stop member being axially adjustably supported in said bore and having means to cooperate with said tool housing for adjusting axial movements thereof, a locating screw radially adjustably mounted in said chuck member and engagable with the stop member for adjusting said stop member in the axial direction, a ring nut threadingly engagable with external threads on the chuck member, said ring nut cooperating with means on said chuck member for securing and releasing said tool housing in said chuck member; wherein the improvement comprises said locating screw having a frusto-conical bearing surface cooperating with an inclined bearing surface on the stop member for said axial adjustment of said stop member, said inclined bearing surface on the stop member extending at an acute angle to the center axis of the chuck member.

3,909,063

ARMREST IN A MOTOR VEHICLE

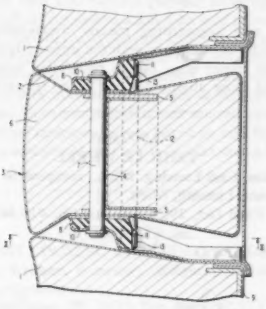
Herbert Bonisch, Sindelfingen, and Bernd Geier, Datzingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Apr. 8, 1974, Ser. No. 459,101

Claims priority, application Germany, Apr. 11, 1973, 2318176

Int. Cl.[2] A47C *13/00*

U.S. Cl. 297—113 **31 Claims**



1. An arm rest in a motor vehicle which is operable to be pivoted between fixed abutment means out of a use position into a non-use position and vice versa, characterized in that a part of said arm rest contacts a non-pivotal elastomer means which exerts a varying resistance to pivotal movement of the arm rest between said use position and said non-use position.

3,909,064

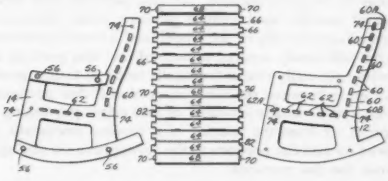
KNOCKDOWN ROCKING CHAIR

C. Lee Payne, Jr., and Vincent J. Gambello, both of Hastings-on-Hudson, N.Y., assignors to Sea Pines Company, Hilton Head Island, S.C.

Filed Mar. 4, 1974, Ser. No. 448,062

Int. Cl.[2] A47C *3/02*

U.S. Cl. 297—440 **7 Claims**



1. A rocking chair, comprising:

two individually unitary side panels, each having:

a rocker cam portion, a front leg and arm post, a rear leg and back support post, a seat support bracket and an arm; the rocker cam, front leg, seat support bracket and rear leg cooperating to define a first generally rectangular opening among them; the seat support bracket, arm post, arm and back support post cooperating to form a second rectangular post among them; a plurality of mortices arranged in a row, descending the back support post, turning, and extending forwardly on the seat support bracket; and

a plurality of slats, each provided with a tenon at each end thereof, the slats being arranged in a row extending transversally between the two side panels, with respective tenons being received in corresponding ones of the mortices;

and fastener means securing at least some of the tenons to the respective side panels to maintain the rocking chair in an assembled, useful condition;

at least a majority of the mortices being completed through the respective panels and the tenons received therein protruding substantially therebeyond;

a minority of the mortices being blind sockets opening toward the inside of the chair; the fastener means comprising threaded elements received through the blind, outer sides of the blind sockets and into the respective tenons, the latter tenons being correspondingly shorter than those which protrude through said completed mortices;

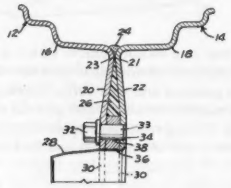
separate arm augmenting means coextending along the outer sides of each arm with the upper edge thereof level with the upper edge of the respective arm; and means securing those augmentations to the respective arms.

3,909,065

VEHICLE WHEEL

John A. Main, East Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Oct. 29, 1973, Ser. No. 410,806
Int. Cl. B60b *3/08*
U.S. Cl. 301—63 DD **11 Claims**



1. A vehicle wheel adapted to receive a tubeless pneumatic tire thereon comprising: two metallic wheel halves each being in one piece and having a rim portion and an integral disc portion, each of said wheel halves having an annular edge with said edges disposed in the vicinity of the junction of the rim and disc portions in generally opposed abutting relation, means adjacent said edges fixing said wheel halves together with said rim portions disposed such that a tubeless pneumatic tire may be received thereon, said disc portions each having a central portion, said central portions being disposed in spaced relation axially of the wheel, and a cured elastomeric material adherently secured to both of said disc portions and extending generally circumferentially to fill at least a portion of the space between the inner faces of said disc portions to provide a seal radially inwardly of said edges preventing the escape of air from the interior of a tubeless pneumatic tire received on said rim portions to the atmosphere via said space between the disc portions.

3,909,066

PLASTIC WHEEL CONSTRUCTION FOR OVERHEAD CONVEYORS

Bryan T. Snowden, Grapevine, Tex., assignor to F.E.I., Inc., Dallas, Tex.

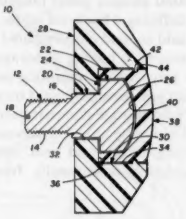
Filed Apr. 29, 1974, Ser. No. 464,967
Int. Cl.[2] B60B *1/06*
U.S. Cl. 301—63 PW **19 Claims**

1. A wheel assembly comprising:

a shaft having a cylindrical bearing portion and a cylindrical retaining portion, said retaining portion including opposed, substantially radially extending surfaces;

a wheel formed from a self-lubricating thermoplastic material and having a central opening formed therethrough including a first cylindrical portion for receiving the cylindrical bearing portion of the shaft and a second cylindrical portion for receiving the cylindrical retaining portion of the shaft, said second cylindrical portion of the opening of the wheel having a surface which engages one of the substantially radially extending surfaces of the retaining portion of the shaft;

a cap formed from a self-lubricating thermoplastic material having a surface which engages the opposite substantially



radially extending surface of the retaining portion of the shaft and received in the second cylindrical portion of the opening of the wheel for cooperation therewith and with the retaining portion of the shaft to secure the wheel in rotatable engagement with the shaft; and

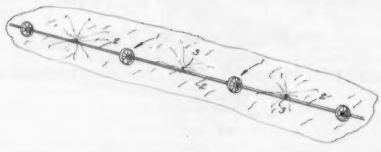
cooperating means on the wheel and the cap for retaining the cap in the second cylindrical portion of the opening through the wheel.

3,909,067

LIGHTWEIGHT SPOKE CONSTRUCTION

Daryl L. Nichols, 240 Hollyview, Eugene, Oreg. 97402

Filed Mar. 8, 1974, Ser. No. 449,255
Int. Cl. B60b *19/00*
U.S. Cl. 301—104 **3 Claims**



1. Extruded spoke construction for an irrigation system wheel, said spoke comprising,

a tubular body portion extending intermediate hub and rim components of the wheel, said tubular body portion having a uniform crossectional configuration throughout its length,

internal end segments of said tubular body portion having screw threads formed therealong for the reception of threaded elements extending axially into the spoke for attachment of the spoke to other wheel components, said threaded elements serving additionally to reinforce said end segments against shear loads,

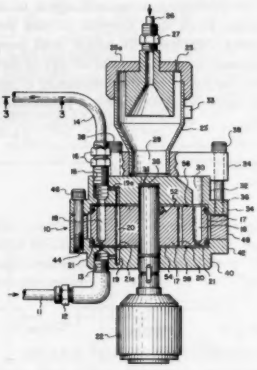
said tubular body portion terminating in integral annular bosses for registration with corresponding openings in hub and rim components of the wheel prior to the insertion of the threaded elements therethrough, said bosses also reinforced against shear loads by passage therethrough of the threaded elements, and

circumferentially spaced ribs of uniform section integral with said body portion and extending the length thereof, each of said ribs terminating in a transversely extending end wall adapted for abutment with arcuate hub and rim surfaces, said ribs reinforcing the tubular body portion against both axial and radial wheel loads.

3,909,068
POWDER FEEDER

Robert G. Coucher, Salt Lake City, Utah, assignor to EPPCO, Salt Lake City, Utah

Filed Jan. 4, 1974, Ser. No. 430,721
Int. Cl.² B65G *53/40*
U.S. Cl. 302—26 **16 Claims**



1. A powder feeder comrising:

a housing having bored therein a powder inlet port, a gas inlet port and a powder-gas outlet port;

a means for introducing particulates into said powder inlet port;

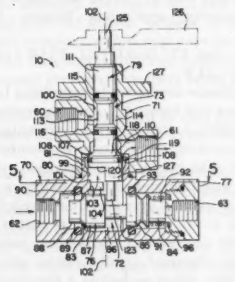
a distribution wheel rotatably mounted on a shaft carried within said housing, said distribution wheel having a plurality of particulate metering cavities and a plurality of cavities for conducting gas only, means for introducing gas into said gas inlet port; and

a means for rotating said distribution wheel so that said gas inlet port will come into alternate registry with said particulate metering cavities and said cavities for conducting gas only.

3,909,069
AIR CONTROL VALVE FOR A PNEUMATIC BRAKE SYSTEM

Harold Durling, Elsie, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 449,707, March 11, 1974. This application Dec. 11, 1974, Ser. No. 531,644
Int. Cl.² B60T *15/48*
U.S. Cl. 303—9 **8 Claims**



1. A control valve for use in a brake system comprising:

a valve body having a first chamber in a first portion thereof and a second chamber in a second portion thereof, said second chamber open at one end and in communication with said first chamber at its opposite end;

a first and second port in communication with said second chamber and a third and fourth port in communication with said first chamber;

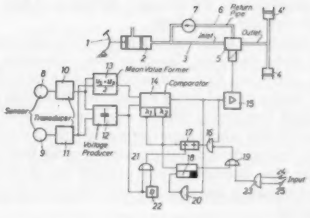
a first pressure responsive plunger slidably disposed within said first chamber, first sealing means associated with said first plunger preventing fluid communication between said third port and said second chamber when said first plunger is in a first position and preventing communication between said fourth port and said second chamber when said plunger is in a second position; and

a second plunger within said second chamber movable between a first and second position, second sealing means associated with said second plunger to isolate said first port from fluid communication with said second port and said first chamber and provide fluid communication between said second port and said first chamber when said second plunger is in a first position, third sealing means associated with said second plunger to prevent fluid communication between said first and second chambers and provide fluid communication between said first and second ports when said plunger is in said second position.

3,909,070
ANTI-LOCKING CONTROL SYSTEM

Heinz Leiber, Leimen, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Aug. 28, 1973, Ser. No. 392,173
Claims priority, application Germany, Sept. 2, 1972, 2243260
Int. Cl.² B60T *8/10*
U.S. Cl. 303—21 P **25 Claims**



1. In a wheeled vehicle having a wheel braking system with wheel brakes associated with the respective wheels, an anti-locking control system for the common control of the brake pressure at the wheel brakes of a plurality of said wheels of said vehicle comprising: sensing means for sensing a tendency to lock on the part of the wheels; first switching means responsive to said sensing means for producing, in a first switching state ("select low"), a signal if at least one wheel shows a tendency to lock and for producing in a second switching state ("select-high") a signal if all wheels show a tendency to lock; and second switching means responsive to an output signal from said first switching means for, after a predetermined time period, switching over said first switching means from said "select low" switching state to said "select high" switching state for a second predetermined time period if said first switching means is in its "select low" state.

3,909,071

VEHICLE ANTISKID BRAKE CONTROL SYSTEM

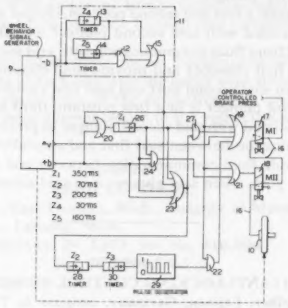
Alfred Klatt, Ronnenberg, Germany, assignor to WABCO Westinghouse G.m.b.H., Hannover, Germany

Filed Apr. 4, 1974, Ser. No. 457,820

Claims priority, application Germany, June 29, 1973, 2333126

Int. Cl.[2] B60T *8/08*

U.S. Cl. 303—21 BE 7 Claims



1. An antiskid brake control system for a vehicle comprising:

a. monitoring means for generating a plurality of different wheel behavior signals representative of the dynamic conditions of a respective wheel of the vehicle;

b. valve means for modulating operator controlled fluid brake pressure supplied to a brake device of said wheel;

c. evaluation means to which said wheel behavior signals are connected for controlling said modulating valve means according to the dynamic behavior of said wheel; the improvement comprising

d. timing means for effecting said connection of at least one of said wheel behavior signals to said evaluation means and for providing first and second timing periods, said second timing period being established following expiration of said first timing period, said connection of said at least one of said wheel behavior signals being interrupted by said timing means during said second time period when the time duration of said at least one of said wheel behavior signals is less than the time duration of said first time period.

3,909,072

PROTECTION CIRCUITRY FOR MONITORING A VEHICLE WHEEL ANTI-SKID AND/OR ANTI-SPIN CONTROL APPARATUS

Georg Geier, Hannover, Germany, assignor to Westinghouse Bremsen-und Apparatebau GmbH, Hannover, Germany

Filed Sept. 4, 1973, Ser. No. 394,354

Claims priority, application Germany, Jan. 25, 1973, 2303490

Int. Cl.[2] B60T *8/00*

U.S. Cl. 303—21 AF 3 Claims

1. A wheel anti-skid and/or anti-spin control system for a vehicle comprising:

a. at least one electro-magnetic control valve device for modulating the braking or driving force on said wheel;

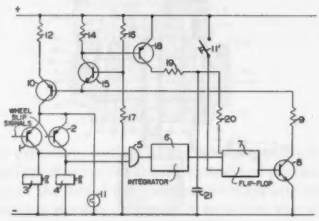
b. positive and negative feed lines via which electric power is provided;

c. power supply switch means to which said electric power is connected;

d. bistable flip-flop means for controlling operation of said power supply switch, said flip-flop means having a normal output condition in which said power supply switch is operated to conduct electrical power to said control valve device;

e. electrical switching means interposed between said control valve device and said power supply switch for controlling the supply of power to said control valve device in accordance with a wheel skid and/or wheel spin signal being provided; and

f. integrator means connected to the output of said switching means for providing a control signal to switch said flip-flop means from said normal output condition to another output condition in which said power supply switch is operated to interrupt the supply of power to said control valve device when the frequency of operation of said control valve device exceeds a predetermined measure.



g. a control resistor connected between said power supply switch and said positive feed line;

h. a first voltage divider across said feed lines consisting of a first resistor connected to said positive feed line and a second resistor connected to said negative feed line;

i. a current limiting switch in parallel with said power supply switch and having an output connected to the control input of said power supply switch and a control input connected between said pair of resistors so as to be activated in response to the voltage drop across said control resistor becoming greater than the voltage drop across said first resistor; and

j. cut-off switch means for providing a second control signal to switch said flip-flop means from said normal output condition to said another output condition responsive to activation of said current limiting switch.

3,909,073

MODULATION DEVICE APPLICABLE ESPECIALLY TO THE BRAKING CIRCUIT OF AN AUTOMOBILE VEHICLE

Gerard de Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed May 17, 1974, Ser. No. 470,730

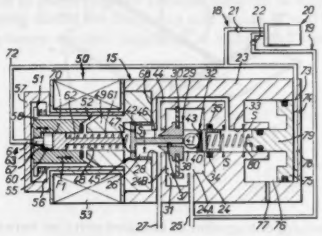
Claims priority, application France, May 24, 1973, 73.18899

Int. Cl.[2] B60T *8/02*; F15B *11/00*

U.S. Cl. 303—21 F 13 Claims

1. A modulation device for interposition between hydraulic control means and hydraulic operating means in a brake circuit, comprising a first chamber communicating with the hydraulic control means, and second chamber communicating with the hydraulic operating means, first and second passage for bringing said first and second chambers into communication with each other, a normally closed regulating valve member disposed in said first passage, a normally open isolating valve member disposed in said second passage, said second passage being disposed axially within said regulating valve member, a first piston including a first face communicating with said second chamber and a second face and at least a calibrated orifice extending between said first and second faces, a second piston axially opposite to said first face of first piston, pin means extending axially between said second and first pistons and projecting from said first face of first piston toward said isolating valve member, resilient means urging

said pin means toward said isolating valve member, and electromagnetic means controlling an armature that engages said second piston for movement therewith in response to energi-



zation of the electromagnetic means thereby displacing said second piston toward said first piston and bringing said first piston into abutment with said second face of the first piston through said pin means.

3,909,074
BRAKE FORCE DISTRIBUTOR

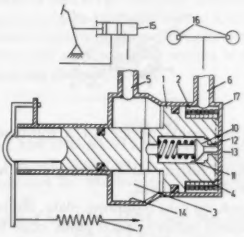
Hermann Seip, Bad Vilbel, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,229

Claims priority, application Germany, Nov. 22, 1973, 2358190

Int. Cl.² B60T *8/22*

U.S. Cl. 303—22 R **1 Claim**



1. A brake force distributor comprising:
a cylinder having a longitudinal axis;
a stepped piston disposed coaxial of said axis in a slidably sealed relation with the interior surface of said cylinder; a first pressure chamber within said cylinder;
a second pressure chamber within said cylinder;
said first and second pressure chambers being separated by said piston;
a pressure medium input connected to said first chamber;
a pressure medium output connected to said second chamber;
a pressure medium passage within said piston coaxial of said axis connecting said first and second chambers;
first means to provide a control force to bias said piston toward said second chamber;
a valve disposed in said passage to control the passage of pressure medium from said input to said output in accordance with the magnitude of said control force; and
second means included as a part of said cylinder to directly connect said first and second chambers upon failure of said control force;
said cylinder including a first portion having a first given inner diameter adjacent said output, a second portion having a second given inner diameter adjacent said input greater than said first given diameter and a third portion interconnecting said first and second portions, and
said piston including a first portion having a third given outer diameter less than said first given inner diameter to provide said second chamber and a second portion having a fourth given outer diameter equal to said first given inner diameter, said piston being maintained in said first portion of said cylinder during the presence of said control force and moved to said second given portion of said cylinder upon failure of said control force to connect said first and second chambers along the outer periphery of said piston,
said second portion of said cylinder providing said second means.

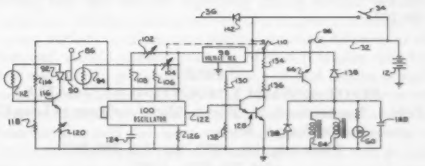
3,909,075
TOWED VEHICLE ELECTRIC BRAKE CONTROL SYSTEM

Rene E. Pittet, Jr., Marshall, and Philip J. Grant, Homer, both of Mich., assignors to Tekonsha Engineering Company, Tekonsha, Mich.

Filed Aug. 2, 1973, Ser. No. 385,102

Int. Cl.² B60T *8/14*

U.S. Cl. 303—24 C **6 Claims**



3. An electronic brake control system for towed vehicles having electric brakes comprising, in combination, a pendulum having a mass defined thereon and having a path of movement parallel to the direction of towed vehicle travel, a light source, a light control member, a light sensing member, one of said members being mounted on said pendulum and the other member being fixed with respect to said pendulum, said light sensing member having a variable electrical resistance proportional to the amount of light sensed thereby, a support member having a pivot shaft transversely disposed to the direction of towed vehicle travel, adjustment means connected to said support member for pivotally adjusting said support member about said shaft to vary the orientation of said support member to the horizontal said pendulum and said light sensing member being mounted on said support member wherein the horizontal orientation and characteristics of movement of said pendulum is adjusted by said support member being adjusted relative to said shaft, a voltage controlled brake control circuit having an input controlled by said light sensing member and having a voltage output determined by the current flow through said light sensing member, and means connecting said output to the towed vehicle electric brakes producing actuation of the towed vehicle electric brakes during braking proportional to the amount of light sensed by said light sensing member.

3,909,076
DUST SEAL FOR ENDLESS TRACKS OF A TRACTOR

Takeshi Kato, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

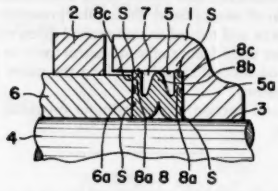
Filed Feb. 7, 1973, Ser. No. 330,398

Int. Cl.² F16J *15/38*

U.S. Cl. 305—11 **3 Claims**

1. A dust seal for endless tracks of a tractor comprising a pin, a first link secured to said pin and having annular recess, a bushing rotatably engaged with said pin and projected at one end into the recess of said first link to form a counter bore portion, and a second link secured to said bushing, wherein

said first and second links having a space therebetween and an annular unitary sealing means for wear resistance and resiliency having annular side edges and at least one tread positioned in said counter bore portion in a compressed state, the outer edges of said tread forming a seal with said first link and



said side edges forming sealing surfaces with the end surface of said bushing and the end of said recess in said first link and for said sealing means maintaining said space and absorbing the thrust force of the bushing in the direction of the axis of the pin.

3,909,077

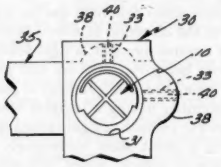
PIVOT ASSEMBLY MOUNTING APPARATUS

Felix L. Leonarduzzi, St. Joseph, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed Aug. 20, 1973, Ser. No. 390,091

Int. Cl. F16c *11/00*

U.S. Cl. 308—2 R **7 Claims**



1. An electronic balance including a balance beam member having a bore for receiving a relatively fragile flexible pivot and including a threaded aperture communicating with said bore; and a threaded holding member threadably fitted in said aperture to engage said flexible pivot when said pivot is fitted in said bore to secure said pivot therein, said holding member including a deformable portion which deforms to allow a tool to tighten said holding member with only a limited force applied to hold said pivot to said beam member.

3,909,078

DRAWER ASSEMBLY

Martin O. Riley, 1330 Hillcrest Ave., Pasadena, Calif. 91106

Filed Apr. 2, 1973, Ser. No. 346,748

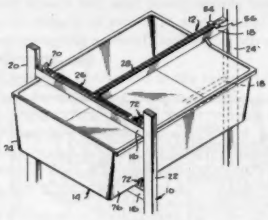
Int. Cl. F16c *17/00*

U.S. Cl. 308—3.6 **11 Claims**

1. A drawer guide adapted to be used with a chest frame that has a sill, comprising:

an elongated cross arm of a low friction material for mounting on said sill, said arm having a thin middle web portion and front and rear edge portions that are thicker than the middle portion so they lie at a greater height than the middle portion;

said edge portions having a plurality of slots that form nubs therebetween for slideably supporting a drawer, whereby



to minimize entrapment of abrasive particles between the drawer and cross arm.

3,909,079

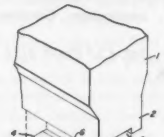
DEVICE FOR ALIGNMENT OF BRIQUETTE ROLLS

William L. Lauterbach, Upper St. Clair Twp., Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 13, 1974, Ser. No. 442,293

Int. Cl.² F16C *35/08*

U.S. Cl. 308—3.9 **12 Claims**



1. An adjustable guide device for a roll-type briquetting machine comprising:

a. a substantially horizontal mounting plate having means for horizontal adjustment,

b. a guide block on said mounting plate, having a substantially horizontal surface and a guide edge for alignment substantially perpendicular to the axis of a mold roll,

c. a vertical pin having threads for engagement with and through said mounting plate and an unthreaded extension for passing through said guide block,

d. a gib substantially parallel to said guide block and situated substantially adjacent to the guide edge thereof, and

e. means for adjusting the position of said gib with respect to the guide edge of guide block.

3,909,080

HYDROSTATIC BEARING

Georg Hallnor, Partille, and Anders Christer Gustafsson, Lerum, both of Sweden, assignors to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Oct. 17, 1973, Ser. No. 407,313

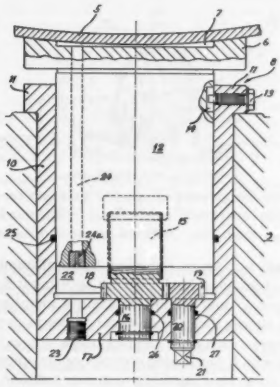
Claims priority, application Sweden, Nov. 3, 1972, 14244/72

Int. Cl.² F16C *35/02*

U.S. Cl. 308—9 **4 Claims**

1. Hydrostatic bearing for a member having a bearing surface comprising at least one bearing block cooperating with the bearing surface, each bearing block mounted in a support member including a body member having a central cylindrical bore, a base member in which the body member is mounted and a piston movable axially in said bore formed with a pocket

at one end confronting the bearing surface and having its opposite axial end confronting the bottom of the bore and spaced therefrom to define a chamber, means connecting the bottom of said bore and said chamber to a pressure medium supply and a conduit in said piston between said chamber and pocket to permit flow of pressure medium to said pocket and adjusting means for displacing said piston in said bore including a screw member engaging in a threaded opening in the



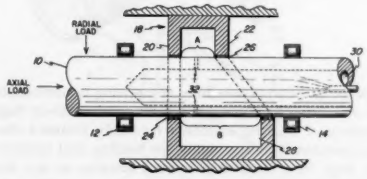
lower axial end face of said piston and having at least a portion thereof disposed in said chamber and means for rotating said screw member to displace said piston axially in said bore, at least a portion of said screw member in said chamber being of a smaller cross section than said piston whereby load on said bearing block is mainly supported by the pressure medium in said chamber and said adjusting means is lubricated by the pressure medium therein.

3,909,081

LOAD BALANCING SYSTEM FOR ROTATING SHAFTS

Donald F. Wilcock, and Leo W. Winn, both of Schenectady, N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Mar. 26, 1974, Ser. No. 455,012
Int. Cl.[2] F16C *7/04*
U.S. Cl. 308—9 **17 Claims**



1. A hydraulic radial load balancer for producing a radial force on a shaft which is rotatably supported by rolling element bearing assemblies and being subjected to radial loads, to balance said loads and relieve said bearing assemblies from the effect thereof comprising:

a. a hollow housing operative to pass said shaft therethrough and having means at each end thereof in a sealing relationship with said shaft and housing to provide seals therefor and define a cavity around said shaft, said seals being disposed at a predetermined angle and not parallel to each other; and

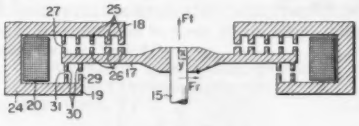
b. means for maintaining a liquid under pressure in said cavity.

3,909,082

MAGNETIC BEARING DEVICES

Hiroaki Ishikawa; Makio Sei, and Isamu Eguchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 30, 1973, Ser. No. 393,194
Claims priority, application Japan, Aug. 30, 1972, 47-86174; Dec. 11, 1972, 47-123359
Int. Cl.[2] F16C *39/00*
U.S. Cl. 308—10 **16 Claims**



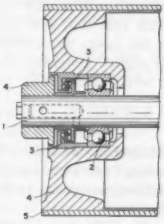
1. A magnetic bearing device comprising a rotatable member secured to a rotatable body for rotation therewith, said rotatable member being formed of a magnetic material and having first and second oppositely facing surface portions, stationary member means formed of a magnetic material and having surface portions disposed in opposing relation to the first and second surface portions of said rotatable member, first and second groups of teeth, each of said groups of teeth including a plurality of opposing teeth formed respectively along concentric paths on opposing surfaces of said rotatable member and said stationary member means with gaps being provided between the opposing teeth of each of said groups, and means for providing magnetic paths between said rotatable member and said stationary member and adapted to magnetically saturate the teeth of said groups, one of said first and second groups of teeth being arranged to become magnetically saturated before the other of said first and second groups of teeth, said one of said first and second groups of teeth having a fewer number of teeth than said other of said first and second groups of teeth.

3,909,083

UNITARY HEAT-SENSITIVE STRUCTURES

Klaus-Heinrich Vahle, Bad Oeynhausen, Germany, assignor to Eisenwerk Weserhutte A.G., Germany

Continuation-in-part of Ser. No. 204,345, Dec. 12, 1971, abandoned. This application May 30, 1973, Ser. No. 365,235
Int. Cl.[2] F16C *13/00*
U.S. Cl. 308—20 **11 Claims**



1. A structure for a conveyor idler, a reversing pulley, a driving pulley, a roller, a wheel for other purposes and the like, comprising; a preassembled subassembly including at least one movable part and at least one heat-sensitive element and a unitary body of a hard foam plastic, having a sufficiently low temperature of formation to prevent damage to said heat-sensitive element and a sufficiently high compressive strength

to hold said subassembly together as a rigid, unyielding, finished structure when hardened, formed about said subassembly in a manner to hold said subassembly together and protect said subassembly from outside influences.

3,909,084

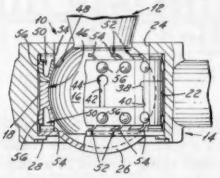
BALL JOINT CONSTRUCTION

Edward A. Snidar, Palm Harbor, Fla.; Donald R. Gaines, Farmington Hills, and William H. Trudeau, Brighton, both of Mich., assignors to Gulf & Western Manufacturing Company (Michigan), Southfield, Mich.

Filed May 16, 1974, Ser. No. 470,540

Int. Cl.[2] F16C *11/06*

U.S. Cl. 308—72 **6 Claims**



1. A retainer for a ball joint construction having a stud with a ball received in a cavity in a housing comprising a body of a slightly resilient high density plastic bearing material having an annular wall with an inner generally spherical peripheral surface to surround and slidably engage in assembly a relatively large equatorial area of the ball around an axis substantially coincident with the axis of the stud, said annular wall having a generally axially and circumferentially extending first groove therein opening into one outer edge of said annular wall to provide generally radially spaced apart first inner and outer generally axially and circumferentially extending portions thereof homogeneously integral therewith, a plurality of circumferentially spaced first webs in said groove interposed between and homogeneously integral with said first inner and outer portions of said annular wall, said first outer portion of said annular wall being dimensioned with respect to the cavity of the housing such that in assembly it is displaced generally radially inwardly adjacent said one outer edge to place said first webs in compression and urge said inner generally spherical peripheral surface into mating engagement with the ball of the stud whereby said inner generally spherical peripheral surface continues to engage the ball of the stud as the mating surfaces wear away during in service use of the ball joint construction, and a plurality of resilient tabs extending in free state generally axially beyond said one outer edge of said body and being homogeneously integral with said body, said tabs being dimensioned such that they are flexed when said retainer is assembled in the cavity to resiliently mount the ball stud in the housing for slightly generally axial displacement in at least one direction with respect to the housing.

3,909,085

PRELOADED BEARINGS

Wilfred Henry Wilkinson, Turnditch, and Leo Bernard Diver, Derby, both of England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Aug. 27, 1974, Ser. No. 500,941

Claims priority, application United Kingdom, Sept. 8, 1973, 42351/73

Int. Cl.[2] F16C *13/00*

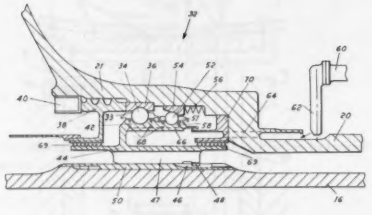
U.S. Cl. 308—189 **2 Claims**

1. A two-row preloaded ball bearing assembly for use between first and second relatively rotating concentric members which are also liable to move axially relative to each other, said bearing assembly having:

a first bearing row race fixedly mounted on said first concentric member,

a second row race axially spaced from said first row race and mounted on said first concentric member, said second row race being axially slideable thereon within limits and axially preloaded towards the first row, and

a common annular race-carrier member mounted on said second concentric member and adapted to carry first and



second row races opposing those aforementioned, said carrier member having means securing it against rotation relative to said second concentric member but allowing axial sliding thereon, and said common annular race-carrier member having radially projecting axially extending dogs which mesh with corresponding splines on the second concentric member to ensure rotation of the carrier therewith without restraining relative axial movement therebetween.

3,909,086

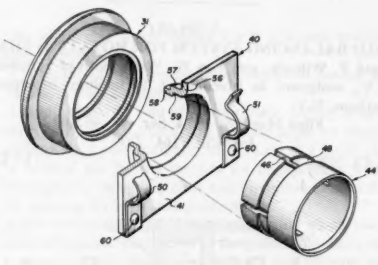
THRUST BEARING ASSEMBLY

John V. Keleshian, Elmwood Park, Ill., assignor to Aetna Bearing Company, Chicago, Ill.

Filed Dec. 13, 1973, Ser. No. 424,291

Int. Cl.[2] F16C *19/00*

U.S. Cl. 308—233 **13 Claims**

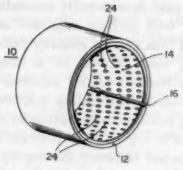


1. A thrust bearing assembly comprising in combination: a bearing member having spaced apart annular thrust rings and a plurality of bearing elements rotatably retained therebetween, annular retaining means for holding said spaced apart thrust rings in a fixed axial spaced relation to one another while permitting relative rotation therebetween about a common axis, a carrier plate having a face portion extending transversely of the axis through said bearing member, said carrier plate having an annular, axially directed flanged portion adapted to receive the inner diameter of said bearing member, said annular, axially directed flange portion having formed as an integral part thereof a retaining ring directed radially inwardly thereof, and an annular elongated sleeve member extending into said bearing member and having an annular groove formed therein to receive said retaining ring, whereby said sleeve is held in position as a result of the engagement between said retaining ring and said annular groove.

3,909,087
COMPOSITE BEARINGS

James W. Cairns, Cherry Hill, N.J., assignor to Garlock Inc., Palmyra, N.Y.

Continuation of Ser. No. 324,548, Jan. 17, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,203
Int. Cl.² F16C 27/00
U.S. Cl. 308—238 27 Claims



1. A high load carrying composite bearing element having a pair of substantially coextensive members disposed in bonded relationship one to another, said bearing element comprising

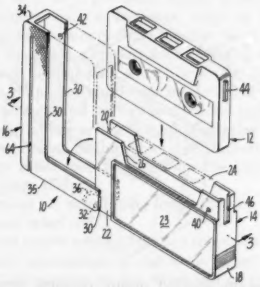
a high strength, resilient bearing surface layer forming one of said members, said surface layer being characterized by a thickness of less than 0.060 inch and consisting essentially of at least one unfilled, solid-lubricant-free material selected from the class consisting of polyarylene sulfides, epoxy resins, aromatic polyamide resins, polyester resins, polyimide resins, polyamide-imide resins, polypropylene resins and polysulfone resins,

said layer having one face bonded to and supported by a rigid, non-porous substrate forming the other of said members.

3,909,088
CASSETTE RECEPTACLE AND STORAGE APPARATUS

F. Michael Dennehey, La Grange, and Reinhold M. Weiss, Chicago, both of Ill., assignors to Memorex Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 71,832, Sept. 14, 1970, abandoned. This application Apr. 29, 1971, Ser. No. 138,480
Int. Cl.² A47B 81/00
U.S. Cl. 312—12 7 Claims



1. A library for storing rectangular cassettes, said cassettes comprising a pair of parallel generally rectangular side walls, edge walls having an aperture therein connecting said side walls closely together to define the shape of a narrow parallelepipedon, a pair of reels mounted between said side walls for rotation about parallel spaced apart axes generally perpendicular to said side walls, and magnetic tape extending between said reels and past said aperture, said library comprising:

a. a plurality of albums comprising

i. a holder for embracing and supporting one of said cassettes, said holder including a receiving portion and defining a cavity for receiving a cassette; and

ii. a cover member for covering at least the receiving portion of said holder with a cassette substantially filling the space in an album;

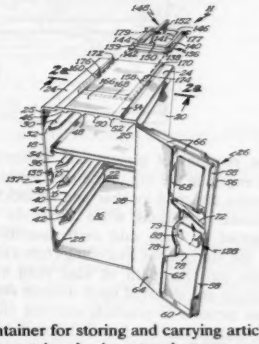
b. library means for removably supporting a plurality of said cover members of the receptacle assemblies in side-by-side relationship when said albums define a library volume; and

c. hinge means interconnecting the holder and the cover member for conveying a cassette in a plane generally parallel to said narrow parallelepipedon to a position at least partially outside the library volume as said album is opened.

3,909,089
CONTAINER FOR STORING AND CARRYING ARTICLES

Donald A. Springer, Lake St. Croix Beach, Minn., assignor to Plastics, Inc., St. Paul, Minn.

Filed July 8, 1974, Ser. No. 486,602
Int. Cl.² B65D 85/54, 79/60
U.S. Cl. 312—138 A 1 Claim



1. A container for storing and carrying articles comprising:

a. a walled container having a top, bottom, a rear wall and side walls,

b. a door hingedly mounted on the container,

c. flange means carried by said door at the edge thereof, operable aligned for engagement with

d. notches formed on the ends of flanges on the interior of a side wall of said container for added support of the wall when said door is closed, and

e. latch means for maintaining said door in closed position upon the container.

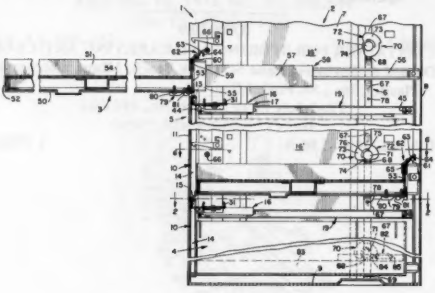
3,909,090
OFFICE APPLIANCE

Gerald Breckner, McDonald; Leo Terlecki, Youngstown; Gabriel Goulish, Youngstown, and James Costello, Youngstown, all of Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio

Filed Nov. 18, 1974, Ser. No. 525,016
Int. Cl.² E05C 15/04
U.S. Cl. 312—217 10 Claims

2. An office appliance including, a cabinet having a pair of spaced apart side walls, a plurality of vertically aligned horizontally displaceable file components disposed within said cabinet, means mounting said components to said side walls for rectilinear movement from a retracted position within the confines of said cabinet to an extended position outside said cabinet, an interlock assembly carried by said cabinet, activating means displaceable upon movement of any one said component and engaging said interlock assembly to limit the number of said components displaceable from a retracted to an extended position at any one time, said file components including shelf assemblies each having a pair of side walls and a rear wall, said mounting means comprising channel elements attached respectively to said cabinet side walls and shelf side walls, said activating

means including a lever pivotally attached to said shelf rear wall, means normally urging said lever into an elevated position, said interlock assembly including a plurality of vertically stacked slidable lock bars disposed adjacent said channel element attached to said cabinet side walls for limited total vertical displacement therein, a cam member attached to each said lockbar for rotary displacement thereon, each said cam member provided with an annular projection extending into the horizontal plane of said shelf lever for activation thereby, a flange on said cam member



having adjacent portions of greater and lesser radii, said flange portions engaging the top of the next lower said lockbar to position the attached lockbar and all lockbars thereabove at alternate elevations when arcuately displaced, stop means carried by each said shelf assembly adjacent said rear wall, and stop means extending from said lockbars and displaceable into the path of said shelf stop means when said lockbars are elevated upon arcuate displacement of one said cam member to preclude outward movement of any additional shelf assembly disposed above an extended shelf assembly.

3,909,091

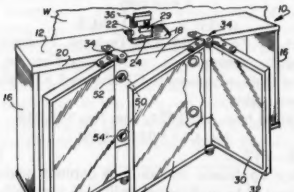
MEANS FOR TEMPORARILY HANGING A CABINET ON A WALL SURFACE PRIOR TO PERMANENT ATTACHMENT OF SAID CABINET

Alfred V. Tantillo, Arlington Heights, Ill., assignor to General Bathroom Products Corporation, Elk Grove Village, Ill.

Filed Sept. 7, 1973, Ser. No. 395,281

Int. Cl.[2] A47B *67/02, 96/06*

U.S. Cl. 312—224 **1 Claim**



1. Means for positioning and temporarily hanging a bathroom cabinet on a supporting wall surface prior to permanent attachment of said cabinet comprising, a cabinet having a housing forming a hollow compartment for storage purposes, said cabinet having a vertical rear wall, spaced horizontal top and bottom walls and spaced vertical side walls all connected to said vertical rear wall and front closure members for opening and closing the front of said cabinet, said front closure members being hingedly secured by hinge means to the cabinet with each closure member adapted to be independently opened and closed and with the closure members having front mirror surfaces whereby said closure members when in closed position have an edge to edge relationship to form a front planar wall for closing said cabinet, said top wall having a downwardly extending rear flange, said vertical rear wall of the cabinet having a single cutout adjacent to the top edge of said rear vertical wall, with said cutout positioned centrally of the length of the cabinet with the top of the cutout extending upwardly of said downwardly extending flange and with said cutout providing bottom and side wall surfaces adjacent the cutout, and with said downwardly extending flange forming a vertical top rear wall surface adjacent said cutout, a single integrally formed bracket for initially positioning and temporarily supporting said cabinet in a hanging position, said bracket having a bottom planar portion continuing with an intermediate forwardly extending portion and with an upwardly extending portion terminating in a forwardly inclined top lip providing the top edge to provide a greater spacing at the top of the bracket between the top lip and the supporting wall surfaces, said bottom planar surface having a plurality of spaced openings, means for initially securing said bracket to the wall surface by a plurality of fastening means having shanks passing through said openings in said bottom planar surface and secured to the wall surface, subsequently positioning said cabinet with respect to said single bracket so that the upwardly extending portion of the bracket is positioned in the single cutout of the back wall with the upwardly extending portion of the bracket engaging the downwardly extending flange adjacent said cutout to temporarily support the cabinet before it is permanently affixed to the wall surface, said top lip of said bracket positioned below the top horizontal wall of the cabinet and covered by said top wall and invisible when viewing the top of the cabinet but with said top lip engaging the underside of the top wall of the cabinet, said single bracket having a length substantially that of the length of the cutout so that when the cabinet is secured to the bracket the cutout is substantially closed, and additional fastening means passing through the back wall of the cabinet to be secured to the wall surface to permanently secure the cabinet to the wall.

3,909,092

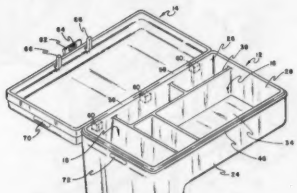
PORTABLE CONSOLE

Thomas H. Kiernan, 1506 Seminole Rd., Grand Rapids, Mich. 49506

Filed May 17, 1974, Ser. No. 470,793

Int. Cl.[2] A47B *83/00;* **B65D** *1/00;* **A47C** *7/68*

U.S. Cl. 312—235 A **6 Claims**



1. An integrally molded plastic portable console for an automobile having a floor and a seat, the seat having a driver's side and a passenger's side, said console comprising:

an L-shaped container having an open interior and an open top, said container comprising a shallow rear portion that rests on the automobile seat and an inwardly tapering depending front portion that extends downwardly over the front of the seat toward the floor, said container having an inner side adjacent the driver's side and an outer side adjacent the passenger's side, said rear portion being subdivided into a plurality of individual compartments by means of integrally formed dividers;

a top comprising a top panel and depending side walls pivotally connected to the container by living hinges at

the outer side thereof, said top being pivotable from a closed position, wherein the top closes the top of the container, to an open position, wherein the container is open and the top extends outwardly from the outer side of the container, the top being formed such that the top serves as an open tray when the top is open and serves as an arm rest when the top is closed;

a stop means mounted on the outer side of the console for holding the top in a generally level position when it is open; and

a carrying handle integrally formed in the console, said carrying handle comprising a hand opening at the top of the depending front portion of the container and a corresponding opening in the front of the top, with the openings being positioned so as to be in juxtaposition when the top is closed, the portions of the top and container between the openings forming the carrying handle.

3,909,093

CABINET WITH AT LEAST ONE WITHDRAWABLE PART

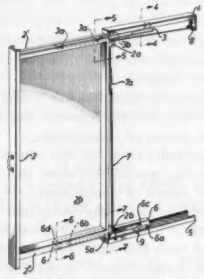
Kurt Bonnie Karl Axel Lundberg, Box 5021, Malarvagen 1, 141 05 Huddinge, Sweden

Filed Apr. 9, 1974, Ser. No. 459,427

Claims priority, application Sweden, Apr. 26, 1973, 7305910

Int. Cl.² A47B *88/00*

U.S. Cl. 312—319 **6 Claims**



1. In a filing cabinet including at least one withdrawable drawer (**2**) such as a pivotable frame section for carrying sheet-like objects such as drawings, maps, or the like, upper and lower guide members (**4,5**) for the drawer, rollers interacting with the guide members for facilitating the withdrawal of the drawer, first and second pulleys (**2***a*, **2***b*) respectively mounted to the upper and lower inside edges of the drawer, and a rope lead around the first and second pulleys, improved means for partially relieving the guide members from stresses upon the withdrawal of the drawer, characterized by:

a. a lower relief rod (**6**) longitudinally displacable in the lower guide member,

b. the drawer, in turn, being longitudinally displacable on the lower relief rod,

c. third and fourth pulleys (**6***b*, **6***c*) respectively mounted in a spaced relationship to the lower relief rod, the third pulley being closer to the outer end of the rod and the fourth pulley being closer to the inner end of the rod,

d. the rope, after leaving the second pulley, being lead forward to and around the third pulley and then back to and around the fourth pulley,

e. one end of the rope being attached to the cabinet adjacent the upper guide member and the other end of the rope being attached to the cabinet adjacent the lower guide member, and

f. rollers (**6d**) mounted on the lower relief rod and engaging with a lower sectional part (**2″**) serving as a guide and belonging to the drawer, whereby the outer end of the lower relief rod constitutes a movable fulcrum for the drawer which is extendable therewith as the drawer is withdrawn, the lower relief rod being so extended by the rope acting on the pulleys.

3,909,094

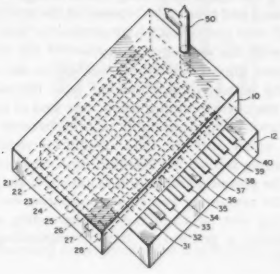
GAS PANEL CONSTRUCTION

Thomas R. Gardner, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 16, 1974, Ser. No. 433,716

Int. Cl.² H01J *9/385*

U.S. Cl. 316—20 **8 Claims**



6. A method of fabricating a gas panel, said method including the steps of:

a. cutting first and second glass plates to a desired size for the gas panel,

b. disposing parallel lines as electrical conductors on each glass plate,

c. disposing a dielectric material composed of lead glass over the parallel lines on each glass plate,

d. securing the first and second glass plates together spaced apart to form a chamber therebetween filled with an illuminable gas, and

e. removing the dielectric coating of lead glass over the end region of the parallel lines on the first and second glass plates by immersing the end regions of the parallel lines on each glass plate in an etchant of perchloric acid until the dielectric coating of lead glass is etched away thereby to expose the end regions of the parallel lines as electrical contacts.

3,909,095

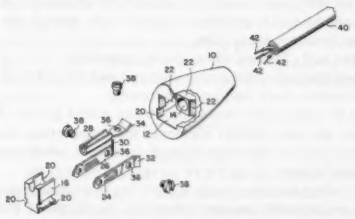
ELECTRIC GROUND CONNECTOR PLUG

Edwin E. James, 306 W. 228th St., Carson, Calif. 90745, and Robert L. Shell, 744 W. 9th St., San Pedro, Calif. 90731

Filed July 22, 1974, Ser. No. 490,801

Int. Cl.² H01R *3/06*

U.S. Cl. 339—14 P **1 Claim**



1. In combination with an electric cable having three flexible conductors insulatedly separated from each other, an electric ground connector plug comprising:

an elongated hollow non-conductive body having a cable receiving rear opening in which one end of the cable is disposed, the end of the rear opening within the body having a chamfered periphery, said body having an enlarged front opening;

a removable non-conductive insert slidably fitting in the front opening, the abutting peripheral surfaces of the insert and the body defining three spaced bores, each bore being adapted to receive an elongated bare conductor;

three screws; and

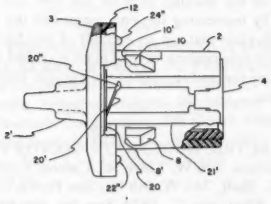
three parallel bare rigid conductors extending in the same direction as the direction of elongation, each conductor being disposed in friction tight engagement with the corresponding bore and extending therethrough with front ends exposed and rear ends disposed in the interior of the body, each rear end of each bare conductor being bent to conform with the appropriate portion of the chamfered periphery to impart additional rigidity to the structure and having a transverse threaded hole threadedly engaged by the corresponding screw, one end of each flexible conductor being detachably secured between a corresponding screw and the bare conductor receiving the corresponding screw, one selected rigid conductor being used for the ground conductor and having U-shaped cross section, the remaining two rigid conductors each having a transverse slot adjacent the corresponding screw for accomodating a portion of the corresponding flexible conductor.

3,909,096

LAMP SOCKET FOR USE WITH PRINTED CIRCUITS AND THE LIKE

Stephen Joseph Brzozowski, Detroit, Mich., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 28, 1974, Ser. No. 446,932
Int. Cl.[2] H05K *1/07*
U.S. Cl. 339—17 D **11 Claims**



1. An electric lamp socket for completing electrical connections to conductors supported on a thin wall, such as the wall of a lamp housing, comprising

a socket body formed of insulating material,

an insert formed of insulating material and shaped to fit into said socket body and latch therewith,

means in said socket body supporting a first group of discrete electric contact elements for completing electric connections to the base of an electric bulb, when inserted in said socket,

means in said socket body supporting a second group of discrete electric contact elements in electrical contact with respective elements of said first group of electric contact elements,

said second group of discrete electric contact elements including spring elements arranged along an outer face of said socket body and adapted to contact external conductor elements, and

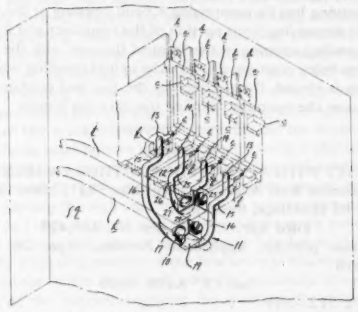
means formed in said insert to engage said first and second groups of electric contact terminals to lock them in conductive engagement in the socket.

3,909,097

BUS BAR TERMINAL MEANS FOR PAIRS OF CIRCUIT-RAKING ELEMENTS

James E. Roth, Festus, and Robert L. O'Hearne, Kirkwood, both of Mo., assignors to Intertherm, Inc., St. Louis, Mo.

Filed Aug. 6, 1974, Ser. No. 495,225
Int. Cl.[2] H01H *75/00;* **H02B** *1/20*
U.S. Cl. 339—19 **1 Claim**



1. For use with two pairs of circuit-breaking elements having points of connection aligned in a plane,

terminal means comprising

an outer substantially rigid bus bar whose span between its ends equals the spacing between the two outermost of such aligned points of connection,

an inner substantially rigid bus bar whose span between its ends equals the spacing between the two innermost of such aligned points of connection,

the ends of said bus bars being prong-like, whereby to facilitate securement to such points of connection,

the portions of both bus bars between their ends being U-shaped and proportioned according to their spans, whereby when viewed perpendicular to said U-shaped portions, the inner bus bar is throughout its length spaced inwardly of the outer bus bar,

said proportioned portions being formed in parallel planes offset from the plane of said prong-like ends when said ends are so aligned for connection, the plane of the inner bus bar portion being offset forwardly of the plane of the outer bus bar portion,

each said offset portion having a mounting flat, and

a supply wire connector lug mounted on each said flat in electrical contact therewith;

whereby to maintain electrical spacing between the bus bars and to avoid contact between the outer bus bar and a supply wire to be connected to the lug on the inner bus bar.

3,909,098

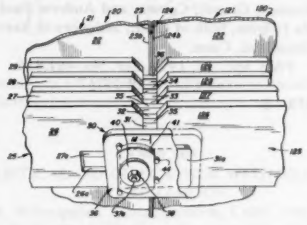
CURRENT TAKE-OFF UNIT

Ronald H. Reed, Versailles; Joseph C. Drilling, and Lary D. Jones, both of Lexington, all of Ky., assignors to Square D Company, Park Ridge, Ill.

Filed Apr. 25, 1974, Ser. No. 464,280
Int. Cl.[2] H01R *13/60*
U.S. Cl. 339—22 B **18 Claims**

1. A current take-off unit adapted to be removably connected to an external current carrying element, said unit comprising a housing having an opening formed in a wall thereof and being positionable adjacent to the external current-carrying element; conductor means within said housing and having an end portion thereof disposed adjacent said opening and terminating short of the adjacent region out-

wardly of said opening; and a connector assembly adjustably mounted on the conductor means end portion for movement between extended and retracted positions relative to said housing opening, said assembly including a pair of conductive jaw members adapted to assume a gripping engagement with the external current-carrying element when said connector assembly is in said extended position whereby said jaw members span the distance between the external current-carrying element and the end portion of said conductor means, an



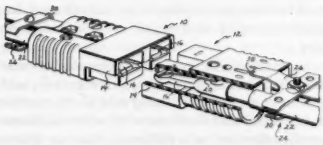
elongated member extending transversely through apertures formed in said jaw member and through the end portion of said conductor means and being in non-conductive relation therewith and retaining same in assembled relation, and manually adjustable to means carried by said elongated member and adapted, when adjusted in one direction, to effect relative movement to said jaw members towards one another into gripping relation with the current-carrying element when said connector assembly is in said extended position.

3,909,099

ELECTRICAL CONNECTOR WITH MOVABLY MOUNTED CABLE CLAMP

Edward D. Winkler, Reading, Mass., assignor to Anderson Power Products, Inc., Boston, Mass.

Filed June 14, 1974, Ser. No. 479,417
Int. Cl.² H01R *25/00, 13/58*
U.S. Cl. 339—47 R **4 Claims**



1. In combination,

A. An electric connector comprising:

1. a hollow insulated housing means;
2. at least one rigid terminal member positioned within the housing means and carried in detached relation to the walls thereof; and,
3. means for spring-biasing said rigid terminal member;

B. An electrical cable mechanically and electrically secured to said rigid terminal member; and,

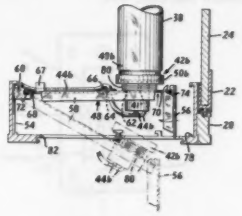
C. Cable clamping means for clamping said electrical cable, said cable clamping means being secured with respect to said electrical connector housing means to permit (i) pivotal movement of said terminal member and electrical cable within a plane containing the longitudinal axes thereof while preventing movement of said terminal member and electrical cable in a direction along the longitudinal axes thereof and (ii) movement of said terminal member and electrical cable within a plane containing the longitudinal and transverse axes thereof.

3,909,100

MOUNTING ARRANGEMENT FOR A LAMP

Thomas Hodge, Jr., 89 East Dr., Watchung, N.J. 07060

Filed May 14, 1974, Ser. No. 469,912
Int. Cl.² H01R *33/08, 33/06, 33/10;* **H05B** *33/02*
U.S. Cl. 339—52 S **6 Claims**



1. A mounting arrangement for a cylindrical lamp comprising:

a. a pair of spaced apart sockets for engaging opposite ends of the lamp so that an electrical connection is made with the lamp, at least one of the sockets being movable toward any away from the other socket;

b. bracket means for mounting the one socket including a first bracket element engaging the one socket and mounted for pivotal movement about one end toward and away from the other socket and a second bracket element pivotally coupled at one end to the other end of the first bracket element;

c. spring means adapted to provide a biasing action axially of the lamp to maintain a secure engagement of the lamp by the sockets, wherein movement of the first bracket element toward the other socket and into a predetermined locking position, when the lamp is disposed between the sockets so as to be engaged thereby, tends to compress the spring means so that secure engagement of the lamp with the sockets will be maintained by the biasing action of the spring means, and movement of the first bracket element away from the other socket and away from the predetermined locking position, when the lamp is engaged by the sockets, tends to release compression of the spring means and permits movement of the one socket away from the other socket so that the lamp can be disengaged from the ockets and axially displaced from between the sockets; and

d. detent means engageable with the other end of the second bracket element, engagement of the detent means with the second bracket element preventing pivotal movement of the second bracket element, thereby maintaining the first bracket element in its predetermined locking position and preventing pivotal movement of the first bracket element about its one end away from the other socket and away from the predetermined locking position.

3,909,101

WALL PLATE FOR FLEXIBLE CONDUIT

John F. Bruels, R.F.D. 1, Danielson, Conn. 06239

Filed June 15, 1973, Ser. No. 370,550
Int. Cl.² H01R *13/58*
U.S. Cl. 339—107 **1 Claim**

1. A power outlet comprising:

A. at least one length of flexible outlet conduit having a socket connector on one end thereof;

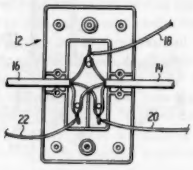
B. a mounting plate;

C. means coacting with the mounting plate for gripping the at least one length of flexible outlet conduit between the one end and the other end thereof;

D. at least one length of flexible power lead conduit connected to form a common electrical connection with the at least one length of flexible outlet conduit;

E. means coacting with the mounting plate for absorbing tensile strain placed on the common electrical connection between the power lead conduit and the flexible outlet conduit, comprising

E1. a cover plate having at least one outwardly extending pin element thereon; and



E2. means for securing the cover plate to the mounting plate, the power lead and the flexible outlet lead being looped around the pin at which the common electrical connection is formed to permit the pin to absorb tensile strain placed on the common electrical connection, the said at least one extending pin element being positioned out of alignment relative to the means for gripping.

3,909,102

COLOR HOLOGRAPHY

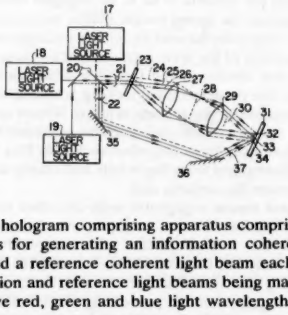
Yoshito Tsunoda, and Fumio Imagawa, both of Hachioji, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 10, 1974, Ser. No. 432,178

Claims priority, application Japan, Jan. 10, 1973, 48-5223

Int. Cl.² G03H *1/30, 1/16*

U.S. Cl. 350—3.5 **4 Claims**



1. A color hologram comprising apparatus comprising:

first means for generating an information coherent light beam and a reference coherent light beam each of said information and reference light beams being made up of respective red, green and blue light wavelength components;

second means for directing said information light beam onto an illumination hologram medium composed of a plurality of illumination holograms disposed at a plurality of different positions thereon, said respective illumination holograms being holograms produced by red, green, and blue light wavelengths at said different positions on said illumination hologram medium corresponding to said red, green and blue light wavelengths and each of said illumination holograms respectively having the property of simultaneously dividing said light beam incident thereon into a plurality of discrete smaller diffracted rays, the phase shifts of which are irregularly distributed relative to one another;

a recording medium disposed in the path of said information light beam;

third means for directing the red, green and blue light rays diffracted by said illumination hologram onto an information storage element and for causing the red, green and blue light rays emanating therefrom to converge at respectively different positions on said recording medium; and

fourth means for directing said reference light beam onto said respectively different positions on said recording medium.

3,909,103

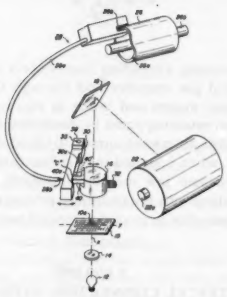
LENS SCAN MECHANISM

Herbert Kenneth Graves, Covina, and Andrew Paul Bessette, Hacienda Heights, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1974, Ser. No. 461,816

Int. Cl.² G02B *27/17*

U.S. Cl. 350—6 **2 Claims**



1. An apparatus for regulating the scan rate of a lens scan system that may use any one of a plurality of lenses having different magnifications, comprising:

a pivot member mounted for pivotally rotating about a fixed member;

a rotatable member having a surface shaped to provide a desired scanning movement of a selected one of said lenses,

lens scan rate adjustment means coupled to said lens and forceably urged against said pivot member, said lens scan adjustment means contacting said pivot member at a first distance from said fixed member when said lens has a first magnification and at a different distance from said pivot point when said lens has a magnification different from said first magnification, and

coupling means for transmitting forces from said rotatable member to said pivot member to have said lens move in accordance with the shape of said rotatable member.

3,909,104

METHOD OF AND DEVICE FOR MODULATING THE CENTER POINT IN OPTICAL TRACKING DEVICES

Josef F. Menke, Glucksburg, Germany, assignor to Electro Optik GmbH & Co., Glucksburg, Germany

Filed Apr. 16, 1973, Ser. No. 351,787

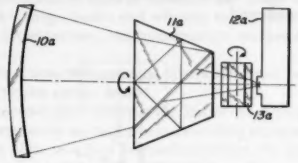
Claims priority, application Germany, Apr. 15, 1972, 2226372; Oct. 11, 1972, 2250113

Int. Cl.² G02B *17/00*

U.S. Cl. 350—6 **12 Claims**

1. A scanning method for passively operative optical tracking systems, which includes in combination the steps of turn-

ing the image of the image field for uniform modulation effected only by rotating a reversion optical system, and deflecting said image in a Cartesian sensing manner ahead of the last image plane.

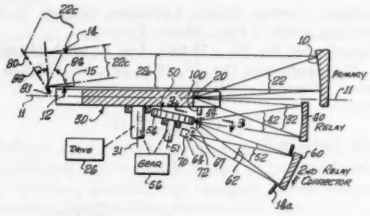


3,909,105

OPTICAL IMAGE SCANNER WITH BEAM STABILIZATION

Robert S. Neiswander, Santa Barbara, Calif., and Clyde W. Harris, Sante Fe, N. Mex., assignors to The Te Company, Santa Barbara, Calif.

Filed June 17, 1974, Ser. No. 479,877
Int. Cl.² G02B 27/17
U.S. Cl. 350—7 **25 Claims**



1. Apparatus for optically scanning a region, comprising

optical objective means for mutually imaging said region and a primary image,

optical scanning means movable with respect to said optical objective means for producing and periodically moving a scan image corresponding to at least an elongated strip of the primary image, said scan image moving periodically in a scan direction longitudinal of the strip,

means for moving said optical scanning means with respect to said optical objective means

field means fixed with respect to said optical objective means for selecting an effective radiation beam corresponding to an elemental area of said moving scan image, aperture means for defining the aperture of the effective radiation beam, the position of the effective radiation beam at said objective means varying with the movement of said scan image, optical relay means for mutually imaging said elemental image area or an optical conjugate thereof and a radiation terminus, said optical relay means including beam deflecting means positioned optically substantially at said elemental image area or an optical conjugate thereof and movable with respect to said optical objective means for veriably deflecting the radiation beam in a plane optically parallel to said scan direction and

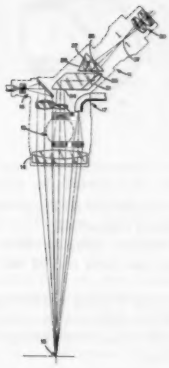
means for controlling the movement of said beam deflecting means in such time relation to the movement of said optical scanning means that the effective radiation beam between said radiation terminus and said beam deflecting means is substantially stationary with respect to said optical objective means.

3,909,106

INCLINED PRISM OCULAR SYSTEMS FOR STEREOMICROSCOPE

Rato Buhler, Brimfield, Mass., assignor to Applied Fiberoptics Incorporated, Southbridge, Mass.

Filed Mar. 19, 1974, Ser. No. 452,507
Int. Cl.² G02B 21/22
U.S. Cl. 350—35 **5 Claims**



1. A stereomicroscope with a compact arrangement of inclined oculars together with illuminating and remote imaging optical systems comprising:

a. a body having objective lens means;

b. a top on said body facing said objective lens means for mounting ocular tubes;

c. a pair of inclined ocular systems mounted side-by-side on said top, each comprising an ocular tube having an inclined axis and containing:

1. an eyepiece;

2. a rhomboid prism having an entrance surface and an exit surface for displacing the line of sight without affecting image orientation or deviating the line of sight; and,

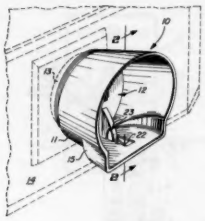
3. a Schmidt prism having six surfaces including an entrance surface, an exit surface forming a substantially 45° angle with said entrance surface, and two further surfaces meeting at a 90° angle to form a roof, the ridge of the roof facing and substantially perpendicular to the ridge produced where entrance and exit surfaces meet at said substantially 45° angle, said rhomboid and Schmidt prisms arranged so that the entrance surface of said rhomboid prism faces said objective lens means, the exit surface of said rhomboid prism faces the entrance surface of said Schmidt prism in parallel spaced adjacency and the exit surface of said Schmidt prism faces said eyepiece, the two prisms being lined up compactly along the inclined axis of said ocular tube thereby providing two plane reflections in the rhomboid prism and two plane and one roof reflection in the Schmidt prism, the roof reflection being in an optical path aligned on the roof ridge; and,

d. illuminating and remote imaging optical systems connected on said top at front and rear positions between said ocular systems whereby four optical systems face said objective lens means in a substantially circular orientation.

3,909,107
HOOD FOR THE LENS OF OPTICAL INSTRUMENTS WITH PIVOTALLY MOUNTED LENS COVER

Jody L. Numbers, 2202 S. Priest, Suite 102, Tempe, Ariz. 85282

Filed Mar. 25, 1974, Ser. No. 454,559
Int. Cl.² G02B *23/16*; G03B *11/04*
U.S. Cl. 350—58 **10 Claims**



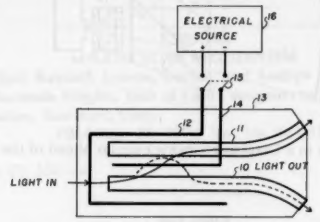
1. A combination hood and lens cap for mounting on the lens mount of a camera comprising:
- a tubular tapered member merging into a cylindrical portion for attaching on the front end of the lens mount of the camera,
- said member defining a ledge extending around its inside periphery at a point adjacent the merging of the tapered member into said cylindrical portion for defining a lens cap seating surface,
- a lens cap pivotally mounted within said member and comprising a substantially flat disc like surface for covering in one position the camera lens, the periphery of said flat disc engaging said seating surface in lens cap closed position,
- said disc having a protrusion extending from its peripheral edge for interfitting with a receiving member on the inside of said member to provide the pivotal mounting of said lens cap, and
- spring means extending between said lens cap and said member for biasing said disc like surface to one of its lens open and lens closed positions,
- said member being distorted along its length to provide an indentation for receiving in juxtapositioned relationship said lens cap when pivoted to its lens open position, whereby said lens cap is moved out of the light path of the lens.

3,909,108
OPTICAL SWITCH AND MODULATOR

Taylor Henry F., San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1974, Ser. No. 473,966
Int. Cl.² G02B *05/14*; G02F *01/29*
U.S. Cl. 350—96 WG **4 Claims**

1. An optical switch and modulator for selectively coupling light energy from one light path to another comprising:
- a first optical waveguide positioned to receive said light energy;
- a second optical waveguide disposed parallel to said first optical waveguide along a predetermined co-extensive length;
- the propagation constant for a guided mode of said second optical waveguide being substantially equal to the propagation constant of a guided mode of said first optical waveguide for causing a shift of the center of guided-wave energy distribution from said first optical waveguide to said second optical waveguide within said predetermined co-extensive length and coupling light energy therebetween;
- a source of electrical potential;
- electrodes disposed contiguous to said first and second optical waveguides along said predetermined co-extensive length for generating electric fields of opposite sense thereacross upon common connection to an electrical potential; and

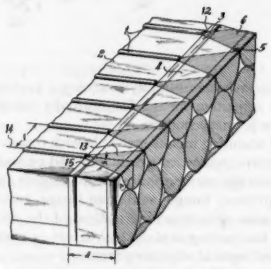


- means for selectively connecting said source of electrical potential to said electrodes, inducing simultaneous changes of opposite sense in the refractive indices of said waveguides for controlling the coupling of light energy therebetween.

3,909,109
OPTICAL FIBER IMAGE MAGNIFYING APPARATUS

Hans-Dieter Aurenz, Mainz, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Continuation of Ser. No. 278,827, Aug. 8, 1972, abandoned.
This application Oct. 29, 1974, Ser. No. 518,528
Claims priority, application Germany, Aug. 9, 1971, 2139827
Int. Cl.² G02B *5/16*
U.S. Cl. 350—96 B **2 Claims**



2. An image magnifying apparatus comprising:
- A. a bundle comprising a plurality of optical fibers of uniform cross-section, said bundle having:
  - 1. an image inlet end for receiving an image as a plurality of image elements wherein:
    - a. the fibers are parallel to one another,
    - b. each fiber is in contact with adjacent fibers,
    - c. each fiber received only one element of the image,
  - 2. an image outlet end wherein:
    - a. the fibers are parallel to one another,
    - b. the distance between any two adjacent fibers is greater than the distance between these two fibers at the image inlet end,
    - c. the distance between any two adjacent fibers is equal to the distance between any other two adjacent fibers,
    - d. the ratio of the distance between any two fibers at the image outlet end to the distance between the same two fibers at the image inlet end is the same for

any two fibers of the bundles and is equal to the magnification created by the apparatus,

e. the spatial relationship between adjacent fibers is the same as at the image inlet end,

3. an intermediate section between the image inlet end and the image outlet end wherein each fiber is of uniform cross-section, the intermediate section comprising:

a. a first zone wherein the fibers need not be in any particular order, and

b. a second zone wherein the fibers are arranged into layers, each layer of fibers extending along a surface of a plate in a first selected direction, the individual fibers in each layer being initially parallel and successively deflecting at the same angle and at at defined interval from the first selected direction to a direction perpendicular to an edge of the plate, the fibers terminating at the edge of the plate thereby forming the image outlet end, and

B. a dispersion plate placed substantially perpendicular to the fibers at the image outlet end, the dispersion plate being spaced from the image outlet end by a light-transmissive and at least periodically plasticly adaptive medium fixed to the image outlet end of the fibers for compensating for any discontinuities present in the image outlet end, and a likewise light-transmissive support plate fixed to the periodically plastically adaptive medium and to the dispersion plate for supporting the dispersion plate at a preselected distance from the image outlet end, wherein:

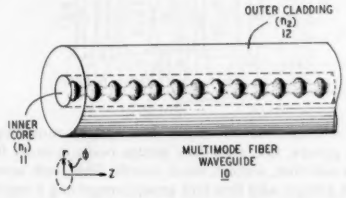
1. the distance of the viewing surface of the dispersion plate from the image outlet end of the bundle is such that adjacent cones of light emitted from fibers of the bundle just touch or overlap on the viewing surface.

3,909,110

REDUCTION OF DISPERSION IN A MULTIMODE FIBER WAVEGUIDE WITH CORE INDEX FLUCTUATIONS

Dietrich Marcuse, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 11, 1974, Ser. No. 522,435
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 WG **5 Claims**



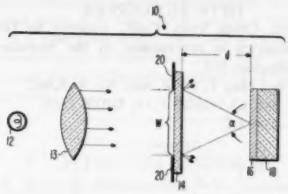
1. An optical fiber waveguide capable of guiding optical wave energy in a plurality of different modes of wave propagation having different group velocities and of dissipating wave energy in the form of radiation modes, said fiber including an inner core of radius a and of an unperturbed refractive index n_1 surrounded by an outer cladding of refractive index n_2 less then n_1, said fiber further including means for minimizing dispersion due to said difference in group velocities comprising means for enhancing coupling among said guided modes in said fiber while minimizing coupling among said guided modes and said radiation modes, said fiber being characterized in that said means comprises spatial fluctuations in the refractive index of said inner core, said core index fluctuating in value periodically along the longitudinal axis of said fiber and in an azimuthal direction about said longitudinal axis.

3,909,111

CONTROLLED ANGLE VIEWING SCREENS BY INTERFERENCE TECHNIQUES

Dietrich Meyerhofer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,417
Int. Cl.² G03B *21/56*
U.S. Cl. 350—117 **5 Claims**



1. A rear projection viewing screen combining high efficiency and uniformity of illumination with predetermined scattering characteristics over a relatively wide field of view about the normal to said screen, said screen comprising:

a. a transparent substrate, said substrate having a pair of opposing surfaces, and

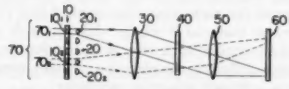
b. a hardened gelatin film on one of said surfaces of said substrate, said gelatin film exhibiting a scattering pattern corresponding to a certain three-dimensional interference pattern recorded therein, the distribution of regions of constructive and destructive interference of said recorded certain interference pattern being distributed substantially randomly with respect to the plane of said screen and in determined preferred orientations with respect to the normal to said screen, whereby said distribution of said recorded certain interference pattern predetermines said scattering characteristics of said screen.

3,909,112

OPTICAL PROCESSING APPARATUS

Masaru Matsumura, Kokubunji; Yoshikazu Miyamoto, Kodaira, and Yoshihiro Onishi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 16, 1972, Ser. No. 297,753
Claims priority, application Japan, Oct. 18, 1971, 46-81683
Int. Cl.² G02B *5/30*
U.S. Cl. 350—160 R **19 Claims**



1. Optical processing apparatus comprising:

a light source;

storage means containing a plurality of pieces of optical information spacially distributed thereover, said light source and said storage means being so arranged as to simultaneously illuminate all of said plurality of pieces of information in said storage means;

optical means, disposed to receive respective light beam portions passing through said storage means from said light source, for producing reconstructed images of said pieces of optical information at a prescribed spacial location;

a single means disposed at said prescribed spacial location, for modulating the amplitude of the light of said reconstructed images of said pieces of optical information;

an optical detector having a plurality of optical detecting elements; and

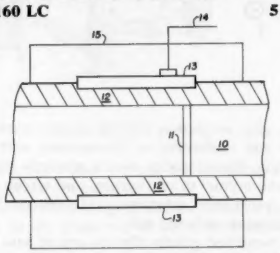
means, disposed to receive the modulated reconstructed images of said pieces of optical information, for simultaneously focusing said modulated reconstructed images onto said optical detecting elements, thereby providing an output representative of the modulated reconstructed images of said pieces of optical information.

3,909,113

OPTICAL COUPLER

Larry B. Stotts, Chula Vista, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 1, 1974, Ser. No. 465,962
Int. Cl.[2] G02B *5/14;* **G02F** *1/16*
U.S. Cl. 350—160 LC **5 Claims**



1. An optical coupler for transferring light energy of selected wavelength and circular polarization comprising:

an optical path comprising light conducting means capable of transmitting light energy including said selected wavelength and circular polarization along a determinable principal optical axis;

a source of light of said selected wavelength and circular polarization and means for directing said light along said axis;

a thin film of cholesteric liquid crystal material disposed in said optical path substantially perpendicular thereto to intercept said principal optical axis,

said material having a homogeneous molecular alignment defined by a determinable helical pitch and direction coinciding with said selected wavelength and circular polarization, respectively, for laterally scattering light energy of said selected wavelength and circular polarization;

transparent electrodes disposed one on each side of said thin film of cholesteric liquid crystal material; and

a source of variable electrical potential arranged for connection across said electrodes, whereby to cause selective variations of the molecular alignment of said cholesteric liquid crystal material from said determinable pitch and direction for rendering it selectively responsive to laterally scatter different wavelengths of light energy commensurate with said selective variations;

and photo-responsive means disposed parallel to said principal optical axis adjacent said light conducting means and said cholerestic liquid crystal material to receive light energy laterally scattered by said cholesteric liquid crystal material.

3,909,114

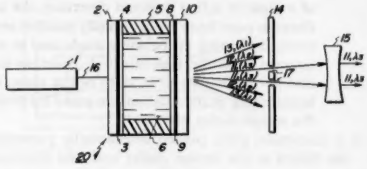
VARIABLE SPHERULITIC DIFFRACTION

Werner E. L. Haas, Webster, and James E. Adams, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,597
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—160 LC **22 Claims**

1. A method of variably diffracting light, comprising:

a. providing on a substrate a layer of aligned liquid crystalline composition comprising a dielectrically negative nematic liquid crystalline material and from about 0.4% to about 3% by weight of an optically acitve material, said liquid crystalline material when not in the aligned state being optically negative and having a light reflection band centered about $\lambda_0 = 2np$ where n = *index of refraction and* p = helical pitch, the ratio of the helical pitch of the non-aligned liquid crystalline composition to the layer thickness of liquid crystalline composition being from about 1 to about 10, said layer of aligned liquid crystalline composition comprising spherulitic regions of liquid crystalline composition;



b. directing light upon said spherulitic regions wherein said light is diffracted; and

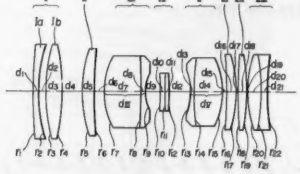
c. applying a voltage across said layer of liquid crystalline composition in an amount less than that required to produce dynamic scattering in said layer of liquid crystalline composition wherein the spherulitic regions of said liquid crystalline composition are increased in size and diffraction of said light is correspondingly altered.

3,909,115

LENS WITH HIGH RESOLVING POWER BUT RELATIVELY SMALL REDUCTION RATIO

Ichiro Kano, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Dec. 20, 1973, Ser. No. 426,813
Claims priority, application Japan, Dec. 26, 1972, 48-996
Int. Cl.[2] G02B *9/00*
U.S. Cl. 350—214 **7 Claims**



1. A non-symmetric telecentric lens system consisting of eight lens groups, said eight lens groups being in order from the object side first, second, third, fourth, fifth, sixth seventh and eighth groups, said first lens group comprising a negative meniscus lens having a convex surface facing the object side, said first lens group performing as a positive lens as a whole, said second lens group comprising a positive meniscus lens having a convex surface facing the object side, said third lens group comprising a convex lens and a concave lens cemented together, said lens having the surface closest to the object side being convex and performing as a negative meniscus as a whole, said fourth lens group comprising a lens including a concave surface closest to the object side and performing as a negative lens as a whole, said fifth lens group comprising a convex lens and a and a concave lens cemented together, a surface of the convex lens facing the object side, said fifth lens group performing as a negative meniscus lens, asaid sixth lens group comprising a positive meniscus lens having a concave surface facing the object side, said seventh lens group comprising a lens having convex surfaces and said eighth group comprising a positive meniscus lens composed of a concave

lens and a convex lens cemented together, said eighth group having a convex surface nearest the object.

3,909,116

LIGHT MODULATING DEVICE

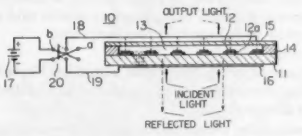
Tadao Kohashi, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sept. 11, 1973, Ser. No. 396,174

Claims priority, application Japan, Sept. 11, 1972, 47-91535; Oct. 19, 1972, 47-105118

Int. Cl.² G05D *25/00*

U.S. Cl. 350—267 **17 Claims**



1. A light modulating device comprising, a substrate, a liquid layer of an electrokinetically movable heterogeneous system disposed on said substrate and containing a liquid material and a coloring material, spaced electrodes, at least one of which being disposed in said layer, and means coupled to said spaced electrodes for selectively setting up electric fields in said layer to cause lateral movement of portions of said heterogeneous system in directions parallel to the surface of said layer to thereby produce variations in the transmissivity of said layer to light passing therethrough.

3,909,117

VEHICULAR REAR VIEWING DEVICE

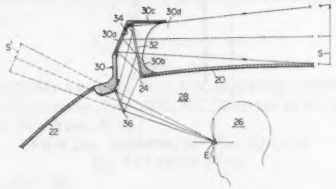
Koichi Takahashi, Yokohama; Tadashi Hayashi, Yokosuka; Jun Kakei, Yokohama, and Ikuo Narusawa, Yokosuka, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Aug. 23, 1973, Ser. No. 390,854

Claims priority, application Japan, Aug. 25, 1972, 47-84610; Feb. 26, 1973, 48-22157; Feb. 26, 1973, 48-22156; Jan. 24, 1973, 48-9477

Int. Cl.² G02B *5/08*

U.S. Cl. 350—302 **13 Claims**



1. A vehicular rear viewing device for producing an erect image of the scene rearwardly of the device comprising, in combination, a first plane mirror having a rear reflecting surface to reflect an image of said scene, a second plane mirror having a front reflecting surface which is in angled vis-a-vis relation to the reflecting surface of said first plane mirror for forwardly redirecting the image reflected from the first plane mirror, and a third plane mirror having a rear reflecting surface which is in angled vis-a-vis relation to the reflecting surface of the second plane mirror and to a driver positioned relative to the third plane mirror for rearwardly reflecting the image from the second plane mirror toward the driver, wherein the second plane mirror is a beam splitting mirror by which the image coincident thereupon upon is partly reflected from its reflecting surface and partly transmitted therethrough, said second plane mirror comprising a first zone on which only the image from said scene is incident, a second zone on which the image from said scene and the image from said first plane mirror are incident, and a third zone on which only the image from said first plane mirror is incident, said first zone having a semi-transparent coating of a thickness which provides a transmittance higher than a reflectance in said first zone, said second zone having a semi-transparent coating of a thickness which provides a transmittance and a reflectance substantially equal to each other in said second zone, said third zone having a semi-transparent coating of a thickness which provides a reflectance higher than a transmittance in said third zone, said transmittance of said first zone being substantially equal to said reflectance of said third zone.

3,909,118

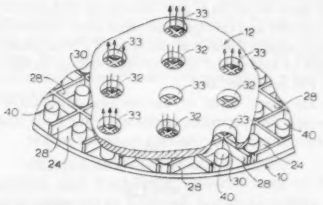
FLUID COOLED MIRROR

Arthur E. Schmidt, Williamsville, N.Y., assignor to Textron, Inc., Providence, R.I.

Filed Mar. 4, 1974, Ser. No. 447,489

Int. Cl.² G02B *5/08*

U.S. Cl. 350—310 **10 Claims**



1. A fluid cooled mirror assembly comprising:

a mirror member having at one face thereof an optically reflective surface and means providing a plurality of coolant circulation receptive cavities therebehind;

said cavities being separated one from another by intersecting side wall portions providing wall intersection formations;

a distributor means disposed in fluid sealing relation against said cavity walls and having some apertures therethrough to provide for flow of coolant fluid through said distributor means in the regions of some of said intersection formations into separate of said cavities, and thence through said cavities in heat-exchange flow relation against the rear of said mirror surface, and thence out through others of said apertures to provide for outlet of heat-carrying fluid, and

manifold means in fluid flow communications with said apertures through said distributor means and with a supply of fluid coolant and with a fluid outlet means.

3,909,119

GUARDED PLANAR PN JUNCTION SEMICONDUCTOR DEVICE

Elden D. Wolley, Auburn, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1974, Ser. No. 440,203

Int. Cl.² H01L *29/90, 29/06, 29/34*

U.S. Cl. 357—13 **9 Claims**

1. A semiconductor device with at least one planar PN junction comprising:

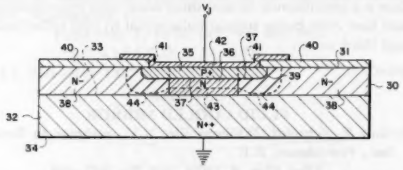
A. a semiconductor body having at least one major surface;

B. a first impurity region of a given conductivity type positioned in the body adjoining selected portions of the major surface;

B. a first impurity region of a given conductivity type from the first impurity region positioned in interior por-

tions of the body adjoining the first impurity region to form a first PN junction therewith, said second impurity region having a lower impurity concentration than said first impurity region and a thickness to support a space-charge region on application of a given reverse bias voltage across said first PN junction;

D. a third impurity region of opposite conductivity type from the first impurity region positioned in the body adjoining the major surface around and adjoining the first impurity region and at least laterally contiguously around the first and second impurity region to form a second PN



junction with the first impurity region, said second PN junction extending contiguously from said first PN junction to adjoin the major surface around and axially spaced from the second impurity region;

E. said third impurity region having an impurity concentration profile and thickness to more than support the space-charge region formed at the second PN junction on application of said given reverse bias voltage across said second PN junction; and

F. an electrode layer of electrically conductive material disposed on the major surface of the body and making ohmic contact with the first impurity region.

3,909,120

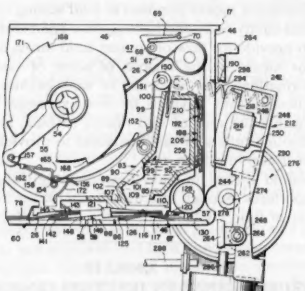
ELECTROMAGNETIC AND ELECTROSTATIC RECORDING SHIELD

Joseph A. Stella, Peabody, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 28, 1973, Ser. No. 374,503

Int. Cl.[2] G03B 31/02

U.S. Cl. 352—29 **12 Claims**



1. A magnetic recording and playback head mechanism for use with a moving cinematographic film strip, having a magnetic sound track on one face thereof and having a photographic emulsion on the opposite face thereof and adapted to receive a layer of processing composition on said opposite face to process a photographic image and including:

transducer means movable from an idle position to an operative position in engagement with said sound track;

means for supporting said film strip in abutment with said transducer means when said transducer means is in said operative position;

means connected to and partially surrounding said transducer means and adapted to cooperate with said supporting means for establishing an electromagnetic and electrostatic shield about said transducer means and a portion of said sound track proximate said transducer means;

said means partially surrounding said transducer means being proximate said supporting means when said transducer means moves into said operative position;

said partially surrounding means and said supporting means being fabricated from material having a high magnetic permeability;

said film strip being disposed within a cassette, and said supporting means being secured within said cassette and adapted to engage said film strip; and

a housing;

said cassette being receivable within said housing and said transducer means being connected to and disposed within said housing;

said transducer means being provided with mounting means for maintaining engagement and a predetermined registration between said transducer means, said sound track, and said supporting means; and

said means partially surrounding said transducer means being adapted to extend partially over opposite faces of said cassette when said transducer means is in said operative position.

3,909,121

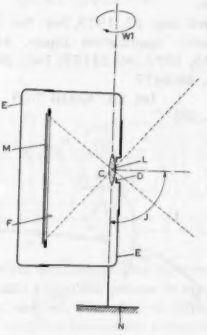
PANORAMIC PHOTOGRAPHIC METHODS

Edgar Antonio de Mesquita Cardoso, Avenida Almirante Gago Coutinho 92, Lisbon, Portugal

Filed June 25, 1974, Ser. No. 482,839

Int. Cl.[2] G03B 37/00

U.S. Cl. 352—44 **11 Claims**



1. A process for effecting panoramic photography with a photographic instrument having an objective lens with an optical axis, an aperture in front of the lens, and an apertured film guide in back of the lens for travel of film therealong, said process comprising uniformly advancing the film continuously along the guide at a predetermined constant rate of speed whereby successive portions of the film are continuously exposed through the aperture in the film guide, and rotating the instrument independently of the advancing of the film on a fixed support about an axis passing through the lens and extending at an angle to the optical axis, the direction and speed of rotation of the instrument relative to said support being such that the net velocity of travel of the film relative to said support is substantially zero.

3,909,122

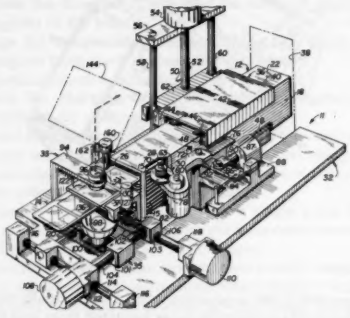
FILM STRIP HANDLING APPARATUS AND METHOD

James O. Haning, Palo Alto; Bram Kool, Saratoga; Jules G. Moritz, Los Altos Hills, and Robert Mizrahi, El Cerrito, all of Calif., assignors to Microform Data Systems, Inc., Menlo Park, Calif.

Division of Ser. No. 101,224, Dec. 24, 1970, Pat. No. 3,743,400. This application Dec. 11, 1972, Ser. No. 313,902

Int. Cl. G03b *23/12*, *21/00*

U.S. Cl. 353—26 1 Claim



1. A method of retrieving recorded information comprising: placing a film strip in an operative position with the film strip having a number of segments in end-to-end relationship and with each segment having a plurality of image frames thereon; selecting a segment and an image frame on the selected segment; applying a force exerted in one direction to a side edge of the film strip to move the same in said one direction along a predetermined path only partially out of said operative position and toward a fixed location spaced therefrom; sensing indicia on the film strip as the latter moves along said path; stopping the movement of the film strip when the selected segment is aligned with said fixed location in response to the sensing of the indicia corresponding to the selected segment; moving an optical path into alignment with the region to be occupied by the selected image frame; projecting the image of the selected image frame onto a viewing screen; and applying a force exerted in the opposite direction to a side edge of the film strip to move the film strip relative to said fixed location in the opposite direction to thereby return it to said operative position.

3,909,123

INDEXING SYSTEM FOR MICROFICHE VIEWER

Dietrich Meyerhofer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 21, 1974, Ser. No. 434,924

Int. Cl.[2] G03B *23/08*

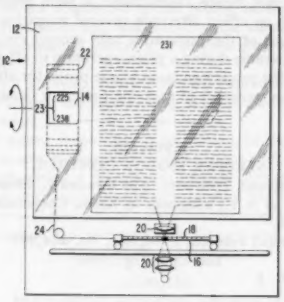
U.S. Cl. 353—27 1 Claim

1. A transparency viewer for viewing a microfiche card having a given plurality of series of indexed pages recorded thereon, each of said given plurality of series occupying a separate row on said card, said viewer comprising

a. stationary means including a viewing screen having an index window hole therein and a lens projection system for imaging a selected single page on said viewing screen,

b. a carrier for mounting said microfiche card which is movable with respect to said stationary means both in a first direction which is orthogonal to the direction of a row and in a second direction which is along a row, whereby movement of said carrier in said first and second directions permits any single page to be selected for projection, and

c. carrier-moving means including a rotatable index wheel mounted to have only an incremental portion of its circumference revealed through said index window hole, linkage means linking said index wheel to said carrier to incrementally move said carrier in said first direction in response to rotation thereof, so that each increment of said index wheel corresponds with the projection of a page from a different row, each revealed incremental



portion of the circumference of said index wheel manifesting identity information of all the pages in the series of the row corresponding to that revealed incremental portion, the movement of said carrier in said second direction being independent of said index wheel and said linkage means.

3,909,124

PROJECTION CONTROL CIRCUIT

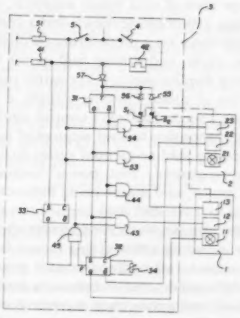
Peter Schmidt, and Karl-Heinz Häberle, both of Stuttgart, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 22, 1972, Ser. No. 255,847

Claims priority, application Germany, Sept. 9, 1971, 2145100; Sept. 9, 1971, 7134351[U]

Int. Cl.[2] G03B *23/16*

U.S. Cl. 353—86 7 Claims



1. For use with two slide projectors, each of the type having actuatable means for effecting forward or reverse slide magazine transport and an actuatable projection lamp, an improved control circuit having means for initiating forward and reverse magazine transport and for selectively controlling actuation of the magazine transport and the sequence in which a change-over of projection by one projection lamp to projection by the other projection lamp occurs in relation to the actuation of magazine transport, said circuit comprising:

first circuit means, including flip-flop circuit means actuatable upon actuation of said forward magazine transport initiating means for providing a signal for effecting said change-over between the projectors, connectable to such

projectors and operable to effect alternate forward magazine transport operation of the projectors and to alternately light and darken the projection lamps, said first circuit means being operable during a given operation to effect change over to the projection lamp of one projector before forward magazine transport of said other projector occurs; and

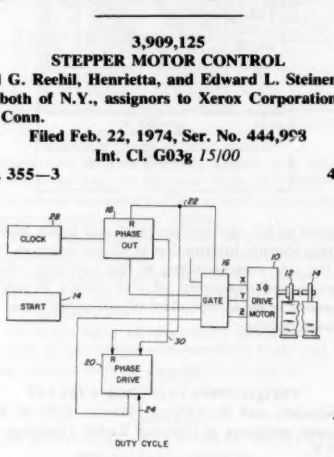
second circuit means connectable to such projectors and operable to effect alternate reverse magazine transport operations of the projectors, said second circuit means being operable during a given operation to effect changeover to the projection lamp of one projector after reverse magazine transport of said one projector occurs.

3,909,125

STEPPER MOTOR CONTROL

Edward G. Reehil, Henrietta, and Edward L. Steiner, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 22, 1974, Ser. No. 444,993
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **4 Claims**



1. In an electrostatographic reproducing system having an image receptor element, the combination comprising an imaging station for placing an image on an area thereon, a transfer station for transferring said image to a copy surface, and means for driving said copy surface to said transfer station with said image area of said image receptor, said means for driving including a multiphase motor and a control system for positioning said motor on a predetermined phase at the beginning of a drive cycle, and driving said motor thereafter over a predetermined displacement, first control means applying a sequential series of phase emitting signals, a record control means providing a second series of control signals, said second control means responsive to said sequential series of control signals for applying said sequential series to said motor in a predetermined sequence, first power means for applying power to said motor, said motor being bidirectional loaded in a first direction to drive said copy surface toward said transfer station and free running in a reverse direction, said second control means including a first gating means for applying said first power means to said motor in said predetermined sequence whereby a predetermined phase is positioned, second power means, second gating means responsive at the end of said predetermined sequence for applying said second power means to said motor in a normal sequence causing said motor to run in said loaded direction.

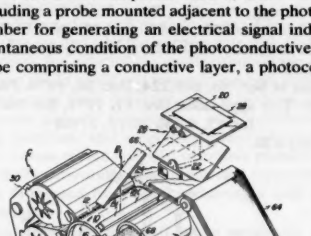
3,909,126

MULTI-PROCESS CONTROL SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Charles A. Whited, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 18, 1974, Ser. No. 452,101
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **14 Claims**

1. An apparatus for regulating an electrophotographic printing machine of the type having a photoconductive member in operative communication with a charging station, an exposure station, a development station, and a transfer station, including a probe mounted adjacent to the photoconductive member for generating an electrical signal indicative of the instantaneous condition of the photoconductive member, said probe comprising a conductive layer, a photoconductive



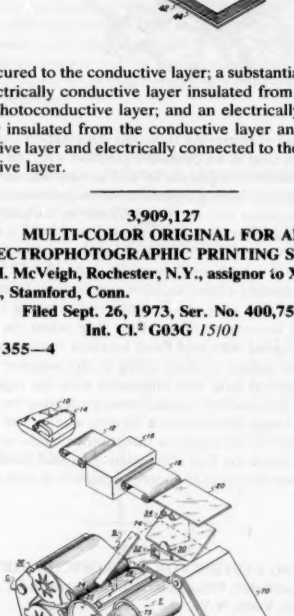
layer secured to the conductive layer; a substantially transparent, electrically conductive layer insulated from and secured to the photoconductive layer; and an electrically conductive member insulated from the conductive layer and the photoconductive layer and electrically connected to the transparent conductive layer.

3,909,127

MULTI-COLOR ORIGINAL FOR AN ELECTROPHOTOGRAPHIC PRINTING SYSTEM

James M. McVeigh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 26, 1973, Ser. No. 400,753
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 **4 Claims**



1. A multi-color electrophotographic printing system, including:

an original comprising a substantially transparent sheet having a coating of pressure transferrable material adhering to one surface thereof, a receiver sheet secured to one marginal region of the transparent sheet, the receiver sheet being disposed adjacent to the surface of the transparent sheet having the transferrable material adhering

thereto, a sheet of colored material interposed between the receiver sheet and the transparent sheet, the colored sheet being visible only in the regions where indicia applied to the transparent sheet transferred the pressure transferrable material from the transparent sheet to the receiver sheet, and a first sheet secured in the marginal region to the transparent sheet on the surface thereof opposed from the pressure transferrable material and arranged to receive the indicia thereon;

means for applying the desired indicia to the first sheet, thereby transferring the pressure transferrable material from the transparent sheet to the receiver sheet in the regions of the indicia;

means for automatically separating the first sheet of said original from the transparent sheet thereof;

a photoconductive member;

means for charging said photoconductive member to a substantially uniform level;

meand for exposing said original to create successive single color images which are projected onto said charged photoconductive member recording thereon successive single color electrostatic latent images;

means for developing the successive single color electrostatic latent images with toner particles complementary in color to the single color light images;

means for transferring successive toner powder images from the corresponding electrostatic latent image to a sheet of support material, each toner powder image being transferred in superimposed registration with the prior one; and

means for affixing permanently the multi-layered toner powder image to the sheet of support material creating a color copy conforming to said original.

3,909,128

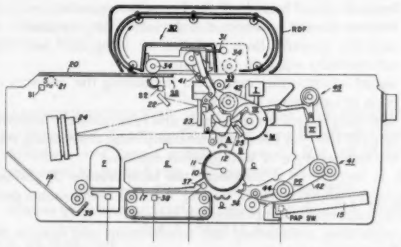
CONTROL LOGIC FOR CHANGING A MULTI-MODE COPIER/DUPLICATOR FROM ONE MODE TO ANOTHER

Lawrence R. Sohm, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 393,544, Aug. 31, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,161

Int. Cl.[2] G03G *15/22*

U.S. Cl. 355—8 **14 Claims**



1. A control apparatus in an automatic reproducing machine having scanning means for scanning a stationary document original and document original feeding means for feeding a document original past said scanning means while said scanning means is held stationary, said machine being designed to operate in a first mode wherein said scanning means is moved for scanning said stationary document original, and in a second mode wherein said document original feeding means is positioned in an engaged position for feeding a document original past said scanning means while it is held in said stationary position, comprising:

mode change starting means including means for moving said document original feeding means from a disengaged position to said engaged position,

control circuitry including means responsive to the movement of said document original feeding means to said engaged position from said disengaged position for completing said mode change operation by conditioning said machine so that said scanning means is held in said stationary position,

a plurality of reproducing step implementing means,

means to set said machine in said first or said second mode, first means responsive to the setting of the machine in said first mode and responsive to the starting operation for generating a plurality of process step implementing signals,

means for applying said process step implementing means for effecting the reproducing steps in said first mode of operation, and

second means responsive to the setting of the machine in said second mode and responsive to the starting operation for generating a plurality of process step implementing signals and applying said process step implementing signals to said plurality of means for effecting the reproducing steps in said second mode of operation.

3,909,129

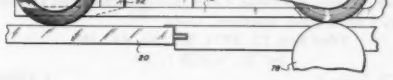
DOCUMENT FEEDING APPARATUS

Warren T. Van Buskirk, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 26, 1974, Ser. No. 464,725

Int. Cl.[2] G03B *27/32, 27/52;* **B65H** *5/16*

U.S. Cl. 355—27 **16 Claims**



1. An apparatus for feeding individual sheets over a transparent platen comprising:

means for feeding said sheets over said platen, said feeding means comprising at least one roll;

means for biasing said roll against said platen, said biasing means comprising a first means for biasing said roll against said platen with a desired force normal to said platen when no sheet is being fed, and a second means for providing an additional force component for stepwise substantially increasing said force normal to said platen to an amount greater than said desired normal force when a sheet is being fed.

3,909,130

MICROPHOTOCOMPOSING APPARATUS FOR MAKING ARTWORKS

Ilya Mikhailovich Glaskov, ulitsa Krasnoarmeiskaya, 8, kv. 21.; Valentin Andreevich Zaitsev, ulitsa Platonova, 19, kv. 22.; Valentin Ivanovich Kuzhelev, ulitsa Kakhovskaya, 38, kv. 53.; Yakov Aronovich Raikhman, ulitsa Pervomaiskaya, 22, korpus 2, kv. 4., and Arnold Petrovich Svidelsky, ulitsa Ya.Kolasa, 88, kv. 45., all of Minsk, U.S.S.R.

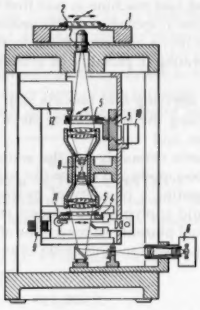
Filed Aug. 24, 1973, Ser. No. 391,253

Int. Cl.[2] G03B *27/52, 27/44, 41/00*

U.S. Cl. 355—40 **4 Claims**

1. A microphotocomposing apparatus for making artworks, comprising: a photographic plate displaceable in two mutually perpendicular directions in its own plane; a projecting lens; a light source operatively associated with said projecting lens; means for forming a pattern in the object plane of said projecting lens, which pattern is projected onto said photographic plate, including two mutually displaceable master artworks disposed intermediate of said light source and said projecting

lens, the patterns thereof being aligned in the object plane of said projecting lens so that a pattern obtained as a result of aligning the patterns of both master artworks is projected onto said photographic plate, said means for forming a pattern in the object plane of said projecting lens including an intermediate lens disposed intermediate of said master artworks, a first of said two master artworks being in the object plane of said projecting lens and a second of said master artworks being in the object plane of said intermediate lens so that the pattern of said second master artwork is transferred by said intermediate lens to the plane of the pattern of said first master artwork.



3,909,131

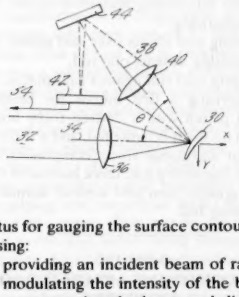
SURFACE GAUGING BY REMOTE IMAGE TRACKING

James P. Waters, Rockville, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1974, Ser. No. 442,269

Int. Cl.[2] G01B *11/24*

U.S. Cl. 356—3 **6 Claims**



1. Apparatus for gauging the surface contour of a test specimen comprising:

means for providing an incident beam of radiation;

means for modulating the intensity of the beam;

means for concentrating the beam and directing the concentrated beam along an incident axis to a spot on the surface of the specimen;

detection means for the production of electronic signals in response to the radiation incident thereon, the detection means being positioned along a collecting axis and having a surface comprising a plurality of discrete zones with a null position between adjacent zones;

means for collecting radiation reflected by the specimen and diverting the collected radiation along the collecting axis to form an imaged spot on the detection means surface;

means responsive to the electronic signals for locating the particular zone of the detection means upon which the imaged is incident and for providing a corresponding position signal;

means responsive to the position signal for causing relative motion between the specimen and the detection means to drive the imaged spot across the surface zone through the null position;

means responsive to the passing of the imaged spot through a null position for providing null signals; and

means responsive to the null signals for indicating the displacement of the imaged spot with respect to the detector between successive null signals.

3,909,132

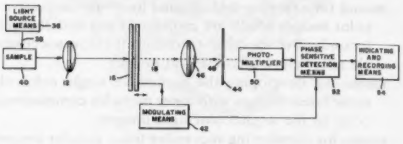
SPECTROSCOPIC TEMPERATURE MEASUREMENT

Joseph J. Barrett, Morris Plains, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed June 11, 1974, Ser. No. 478,405

Int. Cl.[2] G01J *5/60*

U.S. Cl. 356—45 **17 Claims**



1. Apparatus for determining the temperature of a gaseous material by analyzing light having spectral components periodic in frequency, comprising:

a. light conditioning means for collecting, collimating and transmitting said light;

b. interferometric means adapted to receive said light for selectively separating periodic spectra therefrom and transmitting said spectra in the form of a detectable signal, said interferometric means having interference-producing means for providing a plurality of transmission windows regularly spaced in frequency, the frequency spacing between adjacent windows being adjusted to depart from the frequency difference between adjacent spectral components of the periodic spectrum of said gaseous material so as to produce a split-fringe containing first and second branches of the components and scanning means for causing the transmission peaks for adjacent orders to substantially coincide with the spectral lines of either branch of the components, whereby each branch of said split-fringe is derived from a plurality of periodic spectral lines and has an integrated intensity substantially equal to their sum;

c. signal conditioning means for measuring the intensity of each of said branches; and

d. detecting means for indicating and recording the intensity ratio of the branches, said intensity ratio correlating with the temperature of said gaseous material.

15. A method of determining the temperature of gaseous material by analyzing light having spectral components periodic in frequency, comprising the steps of:

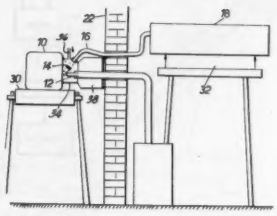
a. collecting, collimating and transmitting said light in the form of a ray path;

b. interferometrically separating periodic spectra from said light by directing said light through a plurality of transmission windows regularly spaced in frequency, the frequency spacing between adjacent windows being adjusted to depart from the frequency difference between adjacent spectral components of the periodic spectrum of said gaseous material so as to produce a split-fringe containing first and second branches of the components, and scanning said ray path to cause the transmission peaks for adjacent orders to substantially coincide with the spectral lines of either branch of the components;

c. transmitting a detectable signal composed of said split-fringe, each branch of said split-fringe being derived from a plurality of periodic spectral lines and having an integrated intensity substantially equal to their sum;

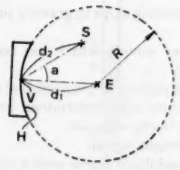
d. measuring the intensity of each of said branches; and
e. detecting and recording the intensity ratio of the branches, said intensity ratio correlating with the temperature of said gaseous material.

3,909,133
ANALYSIS OF METALS
John Douglas Hobson, and Teddie Ward Lomas, both of Sheffield, England, assignors to Dunford Hadfields Limited, England
Filed Aug. 22, 1973, Ser. No. 390,431
Int. Cl.[2] G01J 3/30
U.S. Cl. 356—86 22 Claims



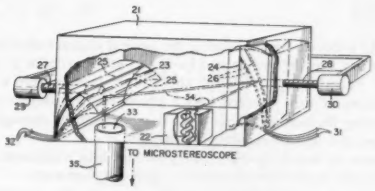
21. A method of analysing solid ferrous, copper and aluminum metals and alloys thereof, comprising,
positioning the metal to be analysed in a predetermined location,
mounting radiation producing means and an optical fibre guide in predetermined relationship to each other,
simultaneously moving said mounted radiation producing means and optical fibre guide together toward and away from said predetermined location of the metal being analysed,
exciting the metal being analysed by said radiation producing means to produce radiation emanating from the metal when said radiation producing means is moved toward and is adjacent said predetermined location of the metal being analysed,
transmitting said radiation through said optical fibre guide to a location remote from the metal being analysed, and analysing the transmitted radiation at said remote location.

3,909,134
MONOCHROMATOR WITH A CONCAVE GRATING
Guy Pieuchard, Fontenay-Le-Fleury; Jean Flamand, Chatenay Malabry, and Jean Cordelle, Marly-Le-Roi, all of France, assignors to Jobin-Yvon, Longjumeau, France
Filed July 19, 1974, Ser. No. 489,855
Claims priority, application France, Aug. 6, 1973, 73.28625
Int. Cl.[2] G01J 3/18
U.S. Cl. 356—99 7 Claims



1. A monochromator in which monochromatic selection is carried out solely by rotation of the grating about its apex, comprising a grating in the form of a concave spherical calotte, the lines of which are situated at the intersection of said calotte with a family of quadrics of revolution, one of the foci of which is situated at the centre of curvature of said spherical calotte;
means defining an entry slit for illuminating said grating with a beam of white light; and
means defining an exit slit for collecting monochromatic light reflected from said grating,
wherein said two slits are each situated at a distance from the apex of the spherical calotte of between R and 0.84 R where R is the radius of said spherical calotte, and the angle at which said two slits are viewed from said apex of said spherical segment is between 26° and 65°.

3,909,135
MICROSCOPE COMPARATOR
Harry I. Lipkind, Bethesda, Md., assignor to The United States of America, Washington, D.C.
Filed Mar. 21, 1974, Ser. No. 453,494
Int. Cl.[2] G01B 11/26
U.S. Cl. 356—172 19 Claims

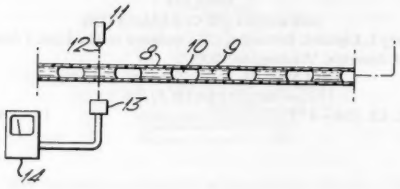


1. A microscope comparator comprising:
a light source producing a very narrow beam of light;
first movable means positioned in the path of said very narrow light beam for reflecting said very narrow light beam a first time;
second movable means placed in the path of said light following said first movable means for reflecting said very narrow light beam a second time;
first moving means operatively associated with said first movable means for moving said first movable means to thereby move said very narrow light beam in a first direction as said very narrow light beam is reflected said first time;
second moving means operatively associated with said second movable means for moving said very narrow light beam in a second direction orthogonal to said first direction as said very narrow light beam is reflected said second time;
directing means following said second movable means in the path of said very narrow light beam for directing said very narrow light beam onto a microscope image;
first sensing means for providing an output indicative of the position of said very narrow light beam on said microscope image with respect to said first direction; and
second sensing means for providing an output indicative of the position of said very narrow light beam on said image with respect to said second direction whereby each time said first and second movable means are moved by their respective moving means to thereby move the position of said very narrow light beam on said image, said first and second sensing means provide outputs indicating the position of said very narrow light beam on said image for each position of said first and second movable means.

3,909,136
METHOD AND APPARATUS FOR MEASURING THE OPTICAL CHARACTERISTICS OF A FLOWING LIQUID STREAM

Alan John Thomas, Richmond, England, assignor to The Rank Organisation Limited, London, England

Filed Aug. 9, 1973, Ser. No. 386,886
Claims priority, application United Kingdom, Aug. 9, 1972, 37074/72
Int. Cl. G01j 3/46, 21/26
U.S. Cl. 356—181 6 Claims



1. In a device for measuring the optical characteristics of a liquid in a flowing stream and having a light source for projecting a beam of light through the stream transversely to the direction of flow thereof and a photo-electric detector for receiving the beam of light after passage thereof through the stream, the improvement comprising:

means to break up the flowing stream into a succession of liquid segments separated by gaseous segments,

a light-transmitting conduit for carrying the segmented stream through the path of the light beam,

means whereby the detector is adpated to provide an output related to the optical characteristics of the liquid, and

a comparator arranged to receive the output of the photoelectric detector and provide a reading the value of which is the difference between that obtained when the light beam is traversing a liquid segment and that when the light beam is traversing a gaseous segment.

3,909,137
DIGITAL INDICATION EXPOSUREMETER

Toru Kisanuki, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed June 18, 1974, Ser. No. 480,395
Claims priority, application Japan, June 18, 1973, 48-69025
Int. Cl.² G01J 1/42
U.S. Cl. 356—223 2 Claims

1. A digital indication exposure meter comprising:

a photoelectric transducer circuit which produces an output current proportional to the intensity of lights incident to a photoelectric element, said transducer circuit including a circuit wherein an integrating capacitor is charged up by a photoelectric current of the photoelectric element in a manner that the voltage across both ends of the capacitor is proportional to the logarithm of quantity of light received during a time of light measuring,

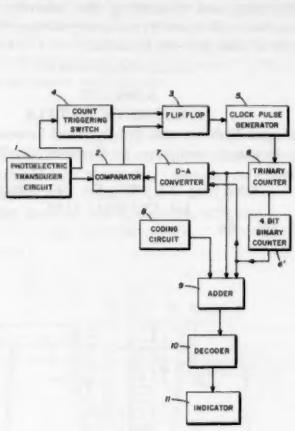
a timer circuit which produces electric signals corresponding to the time of light measuring,

an analog-digital converter which converts the analog output signal of the voltage in the integrating capacitor into a digital form and retain the information in a digital form,

a coding circuit which is set to produce digital signals corresponding to film sensitivity,

adder circuit which computes the digital output of the analog-digital converter together with the digital information from the coding circuit,

a decoder for converting the digital output from the adder into another digital output suitable for numeral displaying, and

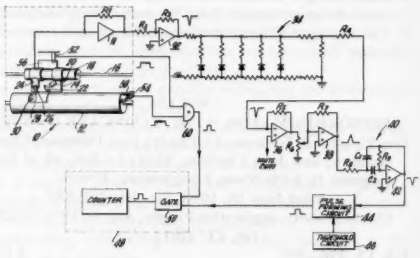


numeral displaying devices for indicating the output of the decoder.

3,909,138
METHOD AND APPARATUS FOR DETECTING SKIPS IN GRAVURE PRINTING

Harvey F. George, West Hempstead; Robert H. Oppenheimer, Glen Cove; Charles G. Marrara, Franklin Square, and David W. Cairns, Glen Cove, all of N.Y., assignors to Gravure Research Institute, Inc., Port Washington, N.Y.

Filed June 3, 1974, Ser. No. 475,958
Int. Cl.² G01M 21/16, 21/32
U.S. Cl. 356—237 13 Claims



1. A method of detecting skips in gravure prints, comprising the steps of:

a. scanning a paper sample which has been subjected to gravure printing;

b. generating an output signal proportional to the amount of light reflected from a predetermined area of the paper sample which is being scanned;

c. stabilizing the output signal;

d. comparing the stabilized signal with a reference signal to produce a difference signal;

e. filtering the difference signal;

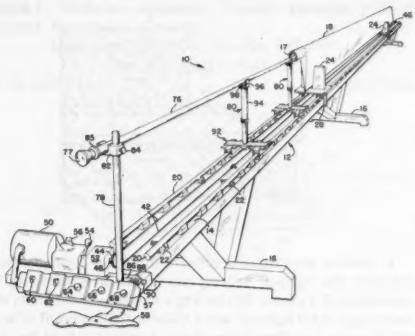
f. forming the difference signal into a pulse when the amplitude of the difference signal exceeds a predetermined amplitude level; and

g. registering each pulse formed in a counter.

3,909,139
METHOD AND MEANS FOR INSPECTING BORE SURFACES IN ELONGATE ARTICLES

George P. Wood, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 17, 1973, Ser. No. 425,382
Int. Cl.[2] G01N *21/16, 21/32*
U.S. Cl. 356—241 7 Claims



1. A method of inspecting the bore surface of a very long elongate hollow helicopter blade with a bore inspection device comprising the steps of:

fixing said inspection device in a longitudinally stationary condition to enable an inspector to remain in a seated position throughout the inspection process;

and longitudinally moving only said blade relative to said inspection device in predetermined increments so that the latter is telescopically inserted within the bore of said blade.

3,909,140
AUTOMATIC FILLING RULING PEN

Leon K. Stryczek, P.O. Box 134, Greenpoint, Brooklyn, N.Y. 11222

Filed Mar. 19, 1968, Ser. No. 714,238The portion of the term of this patent subsequent to June 30, 1990, has been disclaimed.
Int. Cl.[2] B43K *5/08*
U.S. Cl. 401—233 1 Claim

1. A ruling pen, comprising:

an elongated body forming a reservoir;

a pair of nibs mounted at one end of said body in spaced relationship and having respective tips defining a pen point;

means for adjusting the spacing between said tips for varying the width of a line ruled by the pen;

means forming an axially extending capillary channel connecting said reservoir with the space between said nibs for feeding ink to said point;

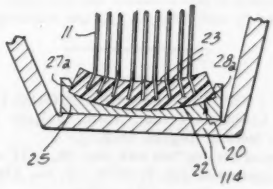
an axially shiftable pin received in said body and movable between a first position blocking the flow of ink from said reservoir to said space and a second position permitting such flow; means operable externally of said body for actuating said pin to displace the same between said positions; and

spring means for biasing said pin into said first position, said means for actuating said pin including a piston shiftable in said reservoir and means for displacing said piston, being disposed at an end of said body remote from said pin and being spaced from said pin in all positions of said piston, said pin extending through the entire length of said channel.

3,909,141
CLAMP BINDING

Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed June 11, 1974, Ser. No. 478,299
Int. Cl.[2] B42F *3/00, 1/00*
U.S. Cl. 402—19 6 Claims



1. A binding for a plurality of thin leaves, comprising a substantially rigid back member having a curved concave surface extending longitudinally therealong between spaced projecting side members, a longitudinally extending insert clamp element flexible from a first condition wherein it is bowed outwardly away from the back member providing a concave first surface facing said back member, and a second convex surface facing away from said back member, exposing a plurality of parallel longitudinally extending cavities having leaf-engaging sides, to a reversely bowed second condition confined between said spaced side members wherein said first surface of the insert element substantially conforms to the concave form of said back member and said cavities are substantially closed with the leaf-engaging sides thereof in retaining contact with said leaves.

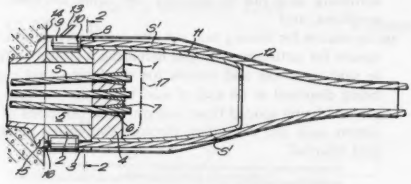
3,909,142
COUPLING ASSEMBLY FOR STRESSING TENDONS OF MULTI-SPAN CONCRETE STRUCTURES

Eric Thornton Surr, Woodlesford, England, assignor to CCL Systems Limited, Surbiton, England

Filed Nov. 16, 1973, Ser. No. 416,687
Claims priority, application United Kingdom, Dec. 5, 1972, 56070/72
Int. Cl.[2] F16G *11/04*
U.S. Cl. 403—41 9 Claims

1. A coupling assembly for the stressing of multi-span post-tensioned concrete structures, comprising a coupling device having centrally disposed axially extending means for anchoring one end of strands of one section of a stressing tendon in a first direction, and other means formed on and about the periphery of said coupling device for anchoring one end of strands of an adjacent section of said stressing tendon in an

opposite direction, a strand deflector operatively associated with said coupling device and extending beyond said coupling device in the same general direction as said strands of said adjacent section of said stressing tendon, said strand deflector extending generally from said other anchoring means and sloping radially inwardly therefrom, and a reducing element fitted over said coupling device adjacent said other anchoring



means and extending beyond said coupling device in the same direction as that of said deflector, said deflector having a portion adjacent said coupling device generally corresponding in outline to adjacent portions of said reducing element whereby strands of said adjacent section adapted to lie between and axially of said deflector and said reducing element will be shaped by said deflector and said reducing element.

3,909,143

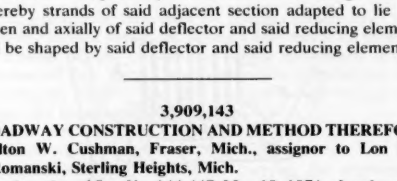
ROADWAY CONSTRUCTION AND METHOD THEREFOR

Walton W. Cushman, Fraser, Mich., assignor to Lon H. Romanski, Sterling Heights, Mich.

Continuation of Ser. No. 144,447, May 18, 1971, abandoned. This application July 5, 1973, Ser. No. 376,396

Int. Cl.[2] E01C *3/00*

U.S. Cl. 404—27 **2 Claims**



1. A roadway, comprising a roadbed, and a road surface carried atop said roadbed, said roadbed comprising a relatively flexible and moisture impervious outer container of exclusively plastic material having an upper wall surface a lower wall surface side wall portions and end wall portions, filler material filling the interior of said outer container, said outer container being hermetically sealed with said interior and said filler material contained therein being evacuated to a gas pressure of a magnitude substantially less than the magnitude of the surrounding ambient atmospheric pressure, said plastic material being elastomeric, said lower wall surface of said outer container being situated at a level below the frost line of the surrounding earth, a trench excavated in the earth, said trench having a lower surface below the frost line of the surrounding earth, and wherein said lower wall surface of said outer container is supported by said lower surface of said trench, and wherein said filler material comprises such earth as was obtained in the excavation of said trench.

3,909,144

PLASTIC SHEET MATERIALS AND STRUCTURES CONTAINING THE SAME

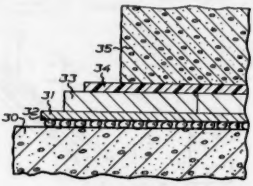
Ole Garn, Greve Strand, and Arne Corlin, Hvidovre, both of Denmark, assignors to Aktieselskabet Jens Villadsens Fabriker, Herley, Denmark

Filed Dec. 13, 1972, Ser. No. 314,539

Claims priority, application United Kingdom, July 26, 1972, 35007/72

Int. Cl.[2] E01C *5/00*

U.S. Cl. 404—31 **8 Claims**



1. Surface coating in combination with a concrete surface wherein the surface coating comprises a reinforcing layer consisting of a plastic film having a modulus of elasticity of not more than 5000 kgf/cm^2 and a Vicat softening point of at least 60° C and a glass fiber layer attached to each side of the plastic film and only partially penetrating thereinto, the thickness of the plastic film being between 0.2 and 5 mm; a bituminous binder attaching said reinforcing layer to the concrete surface and partially penetrating into the glass fiber layer on one side of said reinforcing layer; and a bituminous layer attached to the other side of said reinforcing layer and partially penetrating into the glass fiber layer on that side of said reinforcing layer.

2. The surface coating of claim 1, attached to a traffic-carrying concrete surface.

3,909,145

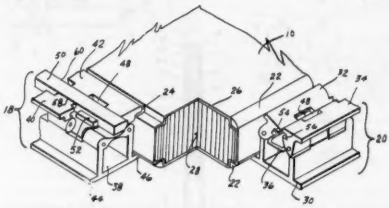
PANEL GRID MODULE CONSTRUCTION SYSTEM

Francois N. Ayer, Watertown; Richard B. Cotter, Dorchester, and Richard E. Chambers, Canton, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 28, 1974, Ser. No. 455,690

Int. Cl.[2] E01C *5/00, 3/00*

U.S. Cl. 404—40 **1 Claim**



1. A panel grid module construction system comprising: a panel having a top, a bottom and sides joining the top and bottom along each edge and having an aluminum honeycomb filler core, recessed means along each edge of the top and bottom, and a resilient seal means mounted in the recessed means; a plurality of interlocking grid beams extending in a first direction, each of said grid beams including a base, a pair of spaced parallel walls mounted on the base, a pair of flanges, each hingedly attached to one of said walls and having a plurality of recesses medially positioned along one edge thereof, a locking spline means having a plurality of projections so positioned to mate with said recesses and adapted to

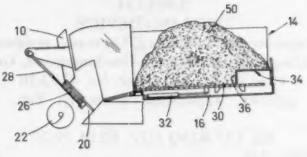
be positioned between each parallel flange, and a beam seal means between said parallel walls and abutting said flanges; a plurality of interlocking grid beams extending in a second direction transverse to said first direction, and mating means adapted to interconnect said beams extending in the said first direction to said beams extending in said second direction.

3,909,146

PAVING MACHINE

Richard C. Hoffman, Agincourt, Canada, assignor to Allatt Limited, Downsview, Canada

Filed Sept. 23, 1974, Ser. No. 508,399
Int. Cl.² E01C *19/18*
U.S. Cl. 404—110 **11 Claims**



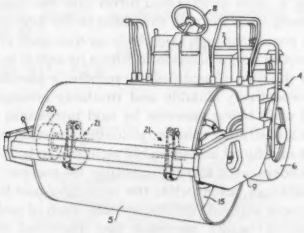
1. A paving machine for spreading paving materials onto a road surface to be paved as the machine is advanced thereover, said machine including a wheeled frame, a hopper for receiving paving materials mounted on the frame, a chute at one end of said hopper through which paving materials are dischargeable from the hopper onto the paving surface, the hopper including a base on which the paving materials are deposited, and which is reciprocable towards and away from said chute for conveying materials to said chute from the opposite end of said hopper, power means operatively related to said base for reciprocating the base as aforesaid, and means mounted within said hopper effective upon reciprocation of the base to sweep the paving materials along the base from the opposite end of the hopper into the chute.

3,909,147

VARIABLE AMPLITUDE VIBRATION GENERATOR

Harry H. Takata, Golden Valley, Minn., assignor to Raygo, Inc., Minneapolis, Minn.

Filed Nov. 7, 1974, Ser. No. 521,754
Int. Cl.² E01C *19/38*
U.S. Cl. 404—117 **21 Claims**



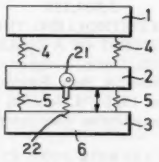
1. A variable amplitude vibration generator comprising:
A. a rotatably mounted shaft;
B. a primary weight eccentrically fixed to the shaft to rotate therewith;
C. a lighter secondary weight;
D. means freely rotatably mounting the secondary weight eccentrically on the shaft, said weights occupying pendent in-phase positions when the shaft is not turning;
E. power means to impart rotation to the shaft in either direction;
the freedom for relative rotation between the secondary weight and the shaft enabling the secondary weight to remain in its pendent position while the shaft begins to turn and moves the primary weight out of phase with the secondary weight; and
F. means to limit relative rotation in either direction between the shaft and the secondary weight to substantially less than 360°, so that upon rotation of the shaft in either selected direction, the two weights become connected in an out-of-phase partially counterbalancing relationship placing the vibration generator in a low amplitude mode of substantially the same magnitude regardless of the direction of rotation which mode it retains as long as the shaft continues to turn in said selected direction.

3,909,148

VIBRATORY COMPACTING MACHINE

Gulertan Vural, Emmelshausen, and Albert Linz, Cologne, both of Germany, assignors to Koehring GmbH - BOMAG Division, Boppard, Germany

Filed June 22, 1973, Ser. No. 372,621
Claims priority, application Germany, June 24, 1972, 2231023
Int. Cl.² E01C *19/34*
U.S. Cl. 404—133 **5 Claims**



1. A vibratory compacting machine comprising:
a machine frame;
a compacting tool;
a compensating mass;
spring means having a low spring stiffness connected between said frame and said compensating mass for supporting said mass from said frame;
means connected to support said tool from said mass; and oscillating vibration means connected between, and to each of said compacting tool and said compensating mass for causing said mass and said tool to vibrate in phase opposition whereby no more than a small portion of such vibrations is transmitted to said frame.

3,909,149

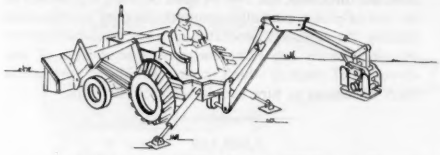
HYDRAULIC VIBRATORY COMPACTOR

Bernard A. Century, Cleveland Heights, Ohio, assignor to Allied Steel & Tractor Products, Incorporated, Cleveland, Ohio

Continuation of Ser. No. 194,674, Nov. 1, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,272
Int. Cl.² E01C *11/16*
U.S. Cl. 404—133 **5 Claims**

1. A high force producing vibratory compaction device for mounting on a heavy-duty vehicle adapted to impart variable forces and movements to said device, comprising a structural support frame, means for rigidly coupling said support frame to the heavy-duty vehicle, a body having a generally horizontal compaction pan and means for generating vibratory motion in said body, and means for flexibly mounting said body on said support frame, said structural support frame being positioned

above said body and having structural arms extending down the sides of said body, said flexible mounting means comprising at least four blocks of material having a low modulus of elasticity extending approximately horizontally in the unstressed condition between said body and the lower extremeties of said structural arms to flexibly couple said structural support frame to said body with a resultant low spring modulus for minimizing the vibrational forces transmitted to the vehicle, said structural arms being laterally positioned at substantially the extremities of said compaction pan and closely



approaching said compaction pan upon the application of normal vertical loading forces on said frame by the vehicle, and said blocks being of a size and positioned to deform substantially under said downward vertical loading toward a downwardly stressed condition with the direction of the resilient force imposed on the body by each block being primarily downward and slightly outwardly to intersect the plane of the base surface of said compaction pan at a location close to the adjacent extremity of said pan for maximum stability under all directions of loading.

3,909,150

APPARATUS FOR CONTROLLING THE FORWARD AND RETURN MOVEMENT OF A DRILLING SPINDLE

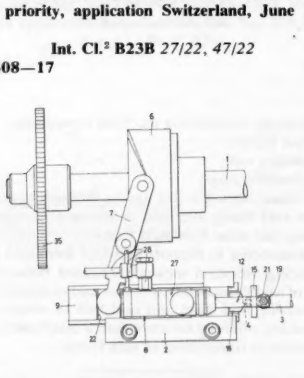
Hans Schaer, Norwalk, Conn., assignor to Fabrique de Machinen Andrë Bechler SA, Bern, Switzerland

Filed June 10, 1974, Ser. No. 478,152

Claims priority, application Switzerland, June 14, 1973, 8640/73

Int. Cl.[2] B23B *27/22, 47/22*

U.S. Cl. 408—17 **2 Claims**



2. An apparatus for controlling the forward and return movements of a drilling spindle comprising, in combination: a primary actuation element for controlling the forward speed of the drilling spindle during the actual drilling operation and the total forward stroke of such drilling spindle during such actual drilling operation, plunger means for operatively connecting the primary actuation element with said drilling spindle, said plunger means incorporating at least two elements relatively displaceable with respect to one another, one of said two elements comprising a substantially cylindrical compartment, the other of said two elements comprising a double-acting piston reciprocal in said compartment, pneumatically operable reversing valve means for the rapid forward and return movements of said drilling spindle, channel means for flow communicating opposite ends of said compartment with said reversing valve means, said reversing valve means including means defining a vent path, a manually adjustable shut-off element provided for said vent path of the reversing valve means, said means defining said vent path including a channel and a number of bores, said shut-off element alternately communicating said channel with a given one of said number of bores as a function of the adjusted position of said shut-off element, a shut-off slide operatively connected with the other element of said plunger assembly, said shut-off slide during rapid return movement of said other element relative to said one element successively closing each of said bores, so that during the course of the rapid return movement of the other element together with the drilling spindle out of the bore hole being machined there is brought about a rapid forward movement of such other element together with the drilling spindle as soon as said shut-off slide closes a predetermined bore of said shut-off element.

3,909,151

DRILLING DEVICE

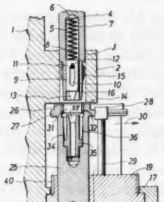
Ludwig Regenbrecht, Gevelsberg, Germany, assignor to Werner Peddinghaus, Sprockhovel-Hasslinghausen, Germany

Filed Feb. 4, 1974, Ser. No. 439,620

Claims priority, application Germany, Feb. 2, 1973, 2305133

Int. Cl.[2] B23Q *5/22;* **B23B** *39/20*

U.S. Cl. 408—140 **10 Claims**



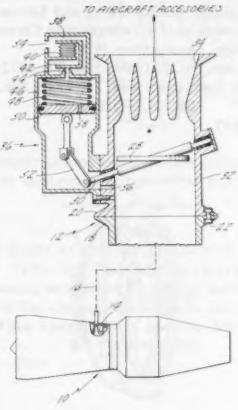
1. A drilling device which includes in combination: frame means, a drilling spindle rotatably and axially displaceably mounted in said frame means, a turret rotatably mounted in said frame means and rotatable about an axis parallel to the axis of said drilling spindle but eccentrically arranged with regard to the axis of said drilling spindle, said turret being provided with a plurality of bores arranged parallel to each other and having their axes arranged parallel to the axis of said turret and along a circle around said turret axis, the diameter of said circle being such that the extension of the axis of said drilling spindle passes through said circle so that each of said bores can be moved into a position in which its axis is in axial alignment with the axis of said drilling spindle, a plurality of tool holders respectively slidably and rotatably arranged in said bores and each being movable by said turret into axial alignment with said drilling spindle, yieldable arresting means associated with said turret and operable yieldably to hold each of said tool holders in a starting position to prevent axial movement of said tool holder while the respective tool holder is in axial alignment with said drilling spindle, each of said tool holders comprising rigidly mounted first frictional clutch means and second frictional clutch means and also positive clutch means, and said spindle comprising a yieldably mounted first frictional clutch section and a positive clutch section and a second rigidly mounted frictional clutch section for respective and successive cooperation directly with the first clutch means and the positive clutch means and the second clutch means of the respective tool holder axially aligned with said tool holder in response to the spindle moving axially toward said aligned tool holder.

3,909,152

VARIABLE SIZE BLEED PORT FOR JET ENGINES

George C. Rannenberg, Canton, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 27, 1973, Ser. No. 401,311
Int. Cl.² F04D 27/02
U.S. Cl. 415—27 7 Claims



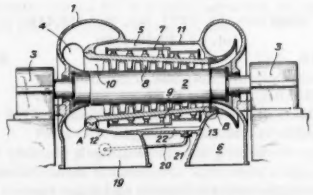
1. A variable bleed port for a compressor section of a turbine type power plant including a connection communicating with the compressor section for supplying pneumatic pressure for aircraft auxiliary systems, valve means including a valve casing in said connection, a valve element in said valve casing defining a given open area when said valve element has completed its travel in the closed direction, a restriction in said valve casing for defining a second, but larger area, when said valve element has completed its travel in the open direction, actuator means connected to said valve element to cause it to open and close, control means responsive to engine operation for controlling said actuator to position said valve element to provide a small bleed port at relatively high engine power and a large bleed port at relatively low engine power.

3,909,153

MULTI-STAGE AXIAL COMPRESSOR

Hans Benz, Winterthur, Switzerland, assignor to Brown Boveri-Sulzer Turbomachinery, Ltd., Zurich, Switzerland

Filed Aug. 23, 1973, Ser. No. 390,898
Claims priority, application Switzerland, Sept. 8, 1972, 13193/72
Int. Cl.² F04D 5/00
U.S. Cl. 415—53 R 2 Claims



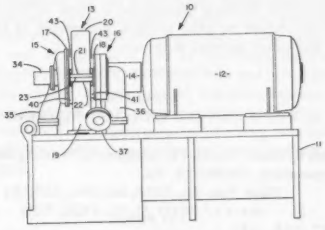
1. A multi-stage axial compressor comprising
a casing;
an inlet duct in said casing for the ingress of a gas to be compressed;
an outlet duct in said casing for the egress of compressed gas;
a stator blade support located between said ducts within said casing to define a sealed casing chamber between said casing and said stator blade support and between said ducts;
a plurality of stator blades sealingly mounted in said stator blade support;
an adjusting mechanism within said casing chamber for adjusting said stator blades; and
a connecting duct outside said casing chamber communicating said inlet duct with said casing chamber to equalize the pressures therebetween, said duct merging into said casing adjacent said outlet duct at a low position in said casing chamber and extending to said inlet duct at a point upstream of said stator blades for draining condensed liquid from said casing chamber into said inlet duct.

3,909,154

CENTRIFUGAL COMPRESSOR

Raymond R. Robb, Latrobe; Donald C. Hewitt, Jeannette; Melvin G. Walter, Jr., Greensburg, and Vijay K. Sood, Murrysville, all of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sept. 5, 1974, Ser. No. 503,402
Int. Cl.² F01D 11/00
U.S. Cl. 415—110 5 Claims

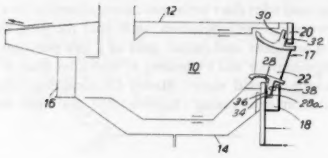


1. In a compressor,
a drive assembly including a base and a removable cover being separable along a generally horizontal parting line, the drive section containing a driving member,
an end plate secured to the base and extending upwardly adjacent to the cover to establish an air passage therebetween,
a compressor casing suspended from the end plate containing a compressor rotor,
a pinion shaft for driving the compressor rotor operatively connected to the driving member, said shaft being rotatably supported within the drive section and extending through a shaft opening formed in said drive assembly and said end plate into the compressor casing,
a seal housing axially split into two sections being mountable about said shaft within said opening with one end of the housing being seated within said end plate and the opposite end of said housing being seated within said drive assembly,
a plurality of radially aligned axially split sealing rings mounted within said housing for encompassing said shaft for forming a vent cavity therebetween beneath said air passage, and
venting means for placing the vent cavity in fluid flow communication with said air passage and means for retaining said vent cavity and said air passage in communication.

3,909,155
SEALING OF VANED ASSEMBLIES

Kenneth George Whinfrey, Darley Abbey, Derby, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed June 20, 1974, Ser. No. 481,408
Claims priority, application United Kingdom, July 6, 1973, 32443/73
Int. Cl.² F01D *25/24*
U.S. Cl. 415—138 **15 Claims**

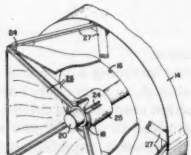


1. A vane assembly for a gas turbine engine, and support means for said assembly, the vane assembly including at least one vane and a radially inner and radially outer shroud member connected to the vane, said support means comprising radially inner and outer support members movably axially relative to each other, said vane assembly being supported between and tiltable by axial relative movement of said radially inner and outer support members, at least one of said shroud members having a chordally extending straight sealing edge cooperating with one of the radially inner and outer support members to make a continuous chordal line sealing contact there between throughout a range of tilt of said vane assembly caused by axial relative movement of said radially inner and outer support members.

3,909,156
GAS TURBINE HAVING EXHAUST BEARING SUPPORT STRUTS

William F. Stahl, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1974, Ser. No. 447,181
Int. Cl.² F01D *25/16;* **F02C** *7/20*
U.S. Cl. 415—142 **5 Claims**

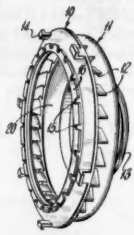


1. A gas turbine engine comprising:
a rotatable shaft for supporting a rotor member,
an outer casing generally coaxial with said shaft,
a plurality of bearings supporting said shaft, and including at least a bearing proximate the downstream end of said shaft,
a plurality of bearing support means obliquely disposed between the downstream end of said casing and said bearing proximate the downstream end of said shaft to maintain concentricity of said bearing during varying thermal conditions, said casing being generally cylindrical over a portion of its length and having a frame of generally square configuration on its downstream end, said frame being disposed axially downstream of said bearing which is proximate the downstream end of said shaft, and said bearing support means being comprised of four yieldable strut members, each of said four strut members extending from a corner of said square casing to points equidistant from one another on the circumference of the outer surface of said bearing.

3,909,157
TURBINE NOZZLE-VANE CONSTRUCTION

Richard L. Wachtell, Tuxedo Park, and Edward C. Palmenberg, Nanuet, both of N.Y., assignors to Chromalloy American Corporation, Orangeburg, N.Y.

Division of Ser. No. 221,306, Jan. 27, 1972, Pat. No. 3,802,046. This application Nov. 21, 1973, Ser. No. 417,788
Int. Cl.² F01D *1/02*
U.S. Cl. 415—217 **7 Claims**



1. As an article of manufacture, a nozzle-vane assembly comprising a longitudinally extending blade element of desired airfoil section, spaced first and second unitary base members having opposed adjacent smooth inner faces and having outer faces spaced from said inner faces, each of said inner faces having a straight-walled recess of constant section corresponding to that of one end of said blade, the spacing between said inner faces being a given blade span, the airfoil of said blade element extending longitudinally for a span which exceeds said given blade span by an amount at least no greater than the combined depths of said recesses, the profile and profile orientation of each recess and of the blade section fitted thereto being so precise as to establish by such fit alone the correct blade-base member orientation for the design class number of the nozzle-vane assembly, said blade element and base members being welded at and for retention of their interfit, and means including a fused filler flux-drawn into the regions of interfit and further uniting the ends of the airfoil section of said blade element to adjacent overlapped regions of said unitary base members.

3,909,158
VANE TYPE FLUID MOTOR

William A. Martin, 804 Via Bella Maria, San Marcos, Calif. 92069

Filed Nov. 16, 1973, Ser. No. 416,416
Int. Cl.² F04C *1/00*
U.S. Cl. 418—257 **8 Claims**

1. A rotary fluid driven motor comprising:
a stator housing,
a rotor mounted within said stator housing for relative rotation to said stator housing,
said rotor comprising a rotor housing, a plurality of rotor vanes, and a pneumatic compensator means for maintaining a radially outward bias on said rotor vanes,
said rotor vanes being mounted for reciprocating radial movement and having an outer end including seal means for sealing against the inner walls of said stator housing during rotation of said rotor,
said pneumatic compensator means being mounted in said

rotor housing and contacting the inner ends of said rotor vanes,

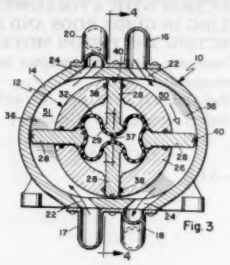


Fig. 3

said pneumatic compensator means comprising a bladder means for containing compressible fluid under pressure.

3,909,159

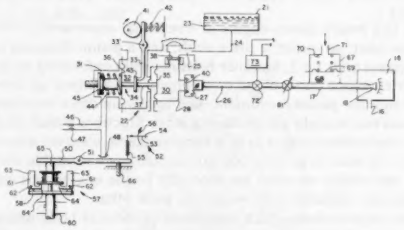
VARIABLE DISPLACEMENT PUMP FOR GAS TURBINE FUEL MANAGEMENT SYSTEM

Harvey B. Jansen, and Milton R. Adams, both of Tempe, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 5, 1973, Ser. No. 338,022

Int. Cl. F04b *9/04*

U.S. Cl. 417—374 **26 Claims**



1. A variable displacement pump for a gas turbine fuel management system comprising:

a. an element disposed for movement in one direction to draw fuel from a supply and in the opposite direction to discharge such fuel from the pump outlet under pressure to a point of use;

b. power driven means mechanically moving said element in the said direction to draw fuel from the supply;

c. combined resilient and fluid pressure responsive means moving said element in the direction to discharge the fuel to the point of use;

d. means for varying the fluid pressure applied to said last-named means to govern the rate of fluid discharge by said element; and

e. throttle means for manually adjusting the effectivity of said fluid pressure varying means.

3,909,160

PUMP FOR SEMI-FLUID MATERIALS

Eugene L. Sherrod, Via Monte Cervino 9, 20052 Monza, Italy

Filed Oct. 26, 1973, Ser. No. 409,786

Int. Cl. F04b *7/00, 15/02*

U.S. Cl. 417—517 **3 Claims**

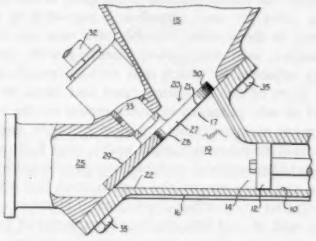
1. A pump comprising a supply hopper and a pair of pump cylinders each having a front end with an opening thereat and a piston operable during its charging strokes to induct material from the hopper into its cylinder through said opening, and operable during its discharge strokes to expel material from its cylinder through said opening, characterized by:

A. the pump cylinders being mounted side by side with their axes substantially horizontal and their front ends adjacent to the underside of the hopper;

B. a manifold connected with the front ends of the cylinders and having the hopper mounted thereon, said manifold having

1. a pair of outlet passages, one for each cylinder and communicating with said opening thereof to conduct material expelled from the cylinder to delivery means,

2. and a pair of inlet passages, one for each cylinder and communicating with said opening thereof, each of said inlet passages opening upwardly to the interior of the supply hopper;



C. valve means rotatable on an axis which is inclined upwardly and forwardly with respect to the cylinder axes, and passes through said manifold

D. said manifold having a forwardly facing surface that is substantially perpendicularly intersected by the upwardly and forwardly inclined axis about which said valve means turns and which has a pair of apertures therein each defining the forward ends of said inlet and outlet passages for one of the cylinders, said manifold surface being intersected by the cylinder axes; and

E. said valve means having passage blocking lobe structure in surface-to-surface contiguity with said surface on the manifold.

3,909,161

ROTARY PUMPS OR ENGINES OF THE SLIDING, ROCKING, ABUTMENT TYPE

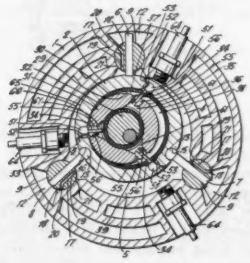
Eric John Stenner, 22 Cleary Rd., Auckland, New Zealand (6)

Filed Apr. 10, 1973, Ser. No. 349,750

Claims priority, application New Zealand, Apr. 10, 1972, 166832

Int. Cl.[2] F01C *1/02, 11/00;* **F04C** *11/00;* **F02B** *53/08*

U.S. Cl. 418—6 **4 Claims**



1. A pump comprising a housing having a cavity defined by an internal peripheral wall and opposed end walls, a shaft rotatably supported in the housing, a piston member journalled eccentrically on said shaft to describe an orbital path within the cavity upon relative rotation between the shaft and

the housing, a plurality of vanes disposed on the periphery of said piston member, one of said vanes being disposed radially and the other of said vanes being rotatably mounted on said piston member so as to move through an arc of movement, a rocking member for each said vane mounted in a mounting therefor in said body and having members defining a vane slot therein in which the appropriate vane slides, sealing means operatively disposed between each vane and the piston member, the housing peripheral wall and the housing end walls to divide the cavity into a plurality of chambers, the volume of each chamber varying as the piston member orbits and means to regulate the admission to and exhausting from each chamber in sequence of a working fluid so that orbiting of the piston member causes such working fluid to be drawn into a chamber and pumped out therefrom with a pumping action in which at least one valve for each chamber is provided by a through passageway in the rocking member of a vane associated with that chamber, said passageway coacting with parts of the mounting adjacent to which said rocking member rocks so that the parts of the mounting open and close an orifice at each end of said passageway independent of the vanes, said displacement member being a hollow cylinder, and a further displacement member mounted within said hollow cylinder, said further displacement member being provided with at least one vane and valve means, the construction and arrangement being such that said further displacement member coacts with the inner wall of said first displacement member to act as an inner pump, said further displacement member carrying a plurality of vanes

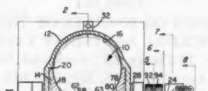
sliding in rocking members, said rocking members carrying passageways having orifices adapted to coact with parts of said first displacement member to form valve means connecting appropriate chambers on said inner pump means with other passageways.

3,909,162

TOROIDAL CHAMBER ROTATING PISTON MACHINE

Ata Nutku, Technical University I.T.U., Istanbul, Turkey

Division of Ser. No. 94,815, Dec. 30, 1970, Pat. No. 3,798,897.
This application Oct. 11, 1973, Ser. No. 405,675
Int. Cl.[2] F04C *15/02*
U.S. Cl. 418—34 **35 Claims**



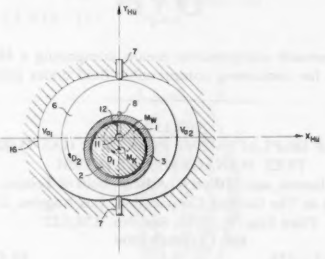
1. Apparatus of the type described, comprising a pair of complementary inner and outer chamber members of smoothly curved arcuate cross-section defining a toroidal chamber therebetween of circular or oval cross-section, said outer member being unitary and substantially continuously inwardly concave relative to the axis of said chamber and said inner member being unitary and substantially continuously outwardly concave relative to said axis, mounting means for supporting the chamber members, at least one of said members being supported for turning movement with respect to said mounting means about said axis of said toroidal chamber and having a piston rigidly fixed thereto and projecting therefrom into said chamber with a surface arranged to sweep a mating surface of the other member.

3,909,163

ROTARY PISTON ENGINE OF TROCHOIDAL CONSTRUCTION WITH A FOLLOWER GEARING TRAVELING IN GUIDE RODS AND FORCIBLY EFFECTING THE PISTON MOVEMENTS

Franz Hüf, Constance, Germany, assignor to Dornier System GmbH., Germany

Filed Oct. 12, 1973, Ser. No. 405,875
Claims priority, application Germany, Dec. 16, 1972, 2261670
Int. Cl.[2] F04C *1/00*
U.S. Cl. 418—61 B **3 Claims**



1. In a rotary piston engine of trochoidal construction having an inlet, an outlet, a drive shaft, and a piston designed as an epitrochoid 1 : 1, an inner housing wall conforming to the outer envelope curve of the epitrochoid, and a follow-up drive effecting the piston movement, said follow-up drive including at least two straight guides having axial directions which cross the longitudinal engine axis, a reciprocatable element associated with each axial direction and containing a rotatable disc, said disc being mounted eccentrically to the engine axis and being non-rotatable with respect to each other,

the improvement which comprises cylindrical body means non-rotatably mounted on the engine drive shaft and eccentrically offset with respect thereto by the extent of the trochoid eccentricity, said cylindrical body having a radius at least equal to the trochoid eccentricity plus the radius of the engine drive shaft, and

sleeve means rotatably mounted on said cylindrical body means and serving as a carrier for elements of the follow-up drive non-rotatably connected thereto, and for the piston.

3,909,164

CASING FOR ROTARY PISTON ENGINES OF TROCHOIDAL CONSTRUCTION

Albert Fritzsche, Markdorf, and Karl Jager, Immenstaad, both of Germany, assignors to Dornier GmbH, Germany

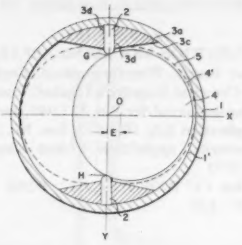
Filed Apr. 1, 1974, Ser. No. 456,884
Claims priority, application Germany, May 11, 1973, 2323789
Int. Cl.[2] F04C *1/02*
U.S. Cl. 418—61 B **4 Claims**

1. In a casing for a rotary piston engine having a trochoidal piston adapted to rotate in a planetary motion around a central axle in the casing, wherein the inner wall of the casing constitutes the outer delimitation of the working chambers and encloses the envelope curve described by the piston during the rotation thereof, and including radial sealing strips at points of the envelope curve in proximity to the axle,

the improvement which comprises that the form of the inner wall of the casing is defined by a circle centrally enclosing the envelope curve,

and filler segment means in said casing at said points of the

envelope curve in proximity to the axle, said filler segment means receiving said radial sealing strips and having



surfaces on both sides of said sealing strips which are tangential to the envelope curve.

3,909,165

GEARED HYDRAULIC APPARATUS

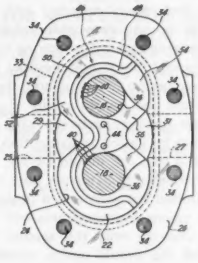
Roger Laumont, Nogent sur Marne, France, assignor to Hydroperfect-International H P I, Marne, France

Filed Jan. 23, 1974, Ser. No. 435,926

Claims priority, application France, Jan. 23, 1973, 73.02257

Int. Cl.[2] F01C *19/08;* **F03C** *3/00;* **F04C** *15/00;* **F01C** *21/04*

U.S. Cl. 418—102 **2 Claims**



1. A geared hydraulic apparatus comprising:

a body defining a central recess, covers secured to opposite ends of said body to close the ends of said recess, said body having high and low pressure fluid ports,

two spaced apart side plates within said recess, each side plate being adjacent to one of said covers,

two cooperating toothed wheels within said recess and mounted on shafts rotatably supported in bearings carried by said side plates,

a substantially W-shaped groove in the face of each side plate which faces its respective cover, each of said grooves partially skirting the bearings carried by its side plate and the ends of said groove terminating at the edge of said side plate and normal to wall of said recess, the ends of said groove being arranged on opposite sides of said low pressure port and the top of the W opening toward said low pressure port, and the cross-sectional shape and dimensions of said groove in directions perpendicular to the length of said groove being constant, and

an elongated gasket in said groove, said gasket being of constant cross-sectional shape and dimensions in directions perpendicular to its length, and said gasket being elongatable in response to fluid pressure at said high pressure fluid port so that the ends of said gasket are pressed against the wall of said recess to prevent fluid leakage around the ends of said gasket.

3,909,166

OIL SEAL MEANS OF A ROTARY PISTON ENGINE

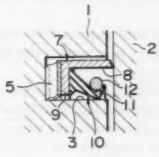
Yoshio Sasaki, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 18, 1973, Ser. No. 425,700

Claims priority, application Japan, Sept. 25, 1973, 48-107698

Int. Cl.[2] F03C *3/00;* **F04C** *27/00*

U.S. Cl. 418—142 **8 Claims**



1. An oil seal means of a rotary piston engine comprising an oil seal ring of L-shaped cross-section having first and second leg portions, said oil seal ring being mounted in an annular oil seal groove of substantially rectangular cross-section and formed as a cut in a side wall portion of a rotor, said annular oil seal groove having first and second side wall and a end wall, the first leg portion of the oil seal ring being positioned substantially parallel with the first side wall of said oil seal groove, and the second leg portion of the oil seal ring extending substantially parallel to the end wall of the oil seal groove, an annular resilient lip member having a first end bonded to the second leg portion of said oil seal ring and a second end adapted to be pressed into the second side wall of said oil seal groove, a ring spring operatively associated with the second end of the resilient lip member for pressing said second end of said resilient lip member into said second side wall of said groove, and a spring means positioned between the end wall of the oil seal groove and the second leg portion of the oil seal ring.

3,909,167

APPARATUS FOR MOULDING HELICAL PARTS BY COMPACTING POWDERED MATERIALS

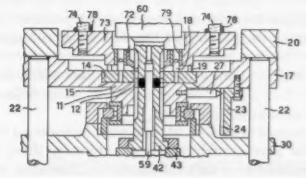
Maurizio Signora, Palazzo Canavese, Italy, assignor to Ing. C. Olivetti & C., S.p.A. Ufficio Brevetti, Ivrea, Italy

Filed Dec. 14, 1973, Ser. No. 424,700

Claims priority, application Italy, Dec. 29, 1972, 71122/72

Int. Cl.[2] B30B *3/06, 11/02*

U.S. Cl. 425—78 **6 Claims**



1. Apparatus for moulding helical gear wheels by compacting powdered materials to be sintered, each wheel including two portions with the teeth inclined in opposite directions, said apparatus comprising:

a machine frame;

a pair of separate dies associated with said two portions each having one helical profile corresponding to the inclination of the associated portion of the helical gear wheel;

means for mounting one of said dies stationary with respect to said frame;

a plate rotatably mounting the other one of said dies;
shifting means for shifting said plate in an axial direction with respect to said dies so as to reciprocate the rotatably mounted die between a first position in which it is in contact with the stationary die to a second position in which it is removed from said stationary die;
a pair of plungers associated with said dies, each one having a helical profile in accordance with the inclination of the helical profile of the associated die;
a pair of supports associated with said plungers, each of said supports rotatably mounting one of the associated plungers;
means for moving said supports in said axial direction to cause said plungers to compact the powder in the associated die, and
cam means for causing said rotatable die to rotate during its said shifting movement in accordance with the helix of its own profile, whereby said rotatable die can be removed after the powder compression from the relevant portion of compacted gear wheel.

3,909,168

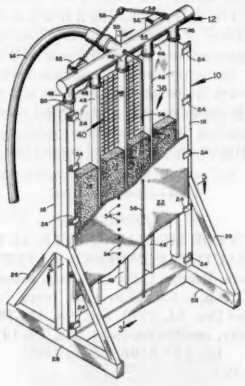
INJECTION TUBE ASSEMBLY AND CONCRETE PANEL FORM

Joseph L. Greenwell, 8320 S.W. 151st St., Kendall, Fla. 33158

Continuation of Ser. No. 235,306, March 16, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 452,054

Int. Cl.[2] **B28B** *13/02*

U.S. Cl. 425—129 **6 Claims**



1. An apparatus for injection molding a monolithic building wall 4 to 6 inches thick and up to 60 feet long, said apparatus comprising:
a vertical mold having a bottom wall, end walls, and side walls and being open at the top, said walls defining the surfaces of said building wall,
a core positioned in said mold, said core including a number of cellular plastic members approximately three inches thick mounted in a vertical relation within said mold, a continuous screen mounted on and connected to each side of said members to support said members in a parallel spaced relation within said mold,
and an injector tube assembly supported for vertical movement into and out of said opening in the mold, said assembly including a manifold and a number of injector tubes connected to said manifold in a spaced relation for movement between said screens in the spaces between said cellular plastic members,
means for admitting into said manifold a premixed cement composition containing a major amount of silica sand, a minor amount of cement and sufficient water to allow the composition to flow through the manifold into the tubes for gravity flow into the mold and means for raising said injector tube assembly at a rate corresponding to the rate the mold is filled.

3,909,169

INJECTION MOULDING APPARATUS

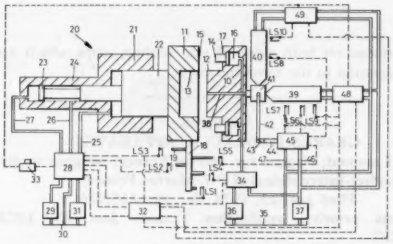
Ian Torrance Barrie, Wheathampstead, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 322,940, Jan. 12, 1973. This application July 10, 1973, Ser. No. 378,020

Claims priority, application United Kingdom, June 27, 1973, 30513/73

Int. Cl.[2] **B29F** *1/10, 1/12;* **B29D** *27/04*

U.S. Cl. 425—130 **20 Claims**



1. Apparatus for injection moulding comprising a mould containing a mould cavity defined by at least two mould members including a first mould member and a second mould member, opposed to, and moveable relative to, said first mould member, moving means for moving said second mould member relative to said first mould member from the position wherein a moulding can be removed from the mould cavity to the position wherein the mould cavity is closed, and vice versa, whereby the distance between said first and second mould members may be varied, two injection means for injecting plastics material into the mould cavity, valve means disposed between said injection means and the mould cavity which can be switched between a first position wherein only the first injection means communicates with the mould and a second position wherein only the second injection means communicates with the mould cavity, mould control means for controlling the movement of said second mould member toward said first mould member, and valve control means for actuating the valve means to switch from said first position to said second position while said second mould member is moving towards said first mould member.

3,909,170

ADJUSTABLE FLAT SPINNERET FOR THE COEXTRUSION OF FLAT FILMS COMPRISING A PLURALITY OF COMPONENTS

Robert Riboulet, Crepieus, and Yves Galery, Saint Maurice de Beynost, both of France, assignors to La Cellophane, Paris, France

Filed Dec. 27, 1972, Ser. No. 318,778

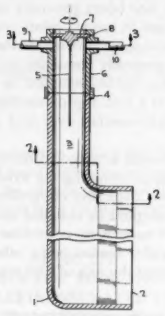
Claims priority, application France, Jan. 11, 1972, 72.00709

Int. Cl.[2] **B29F** *3/12*

U.S. Cl. 425—133.5 **6 Claims**

1. Apparatus for adjusting the flow of at least two extrudable fluids to a coextrusion nozzle comprising a first generally cylindrical conduit having a discharge end and a distal end, feed means for each fluid communicating with the interior of said conduit adjacent the distal end of said conduit, at least two of said feed means each comprising a feed conduit laterally extending from said cylindrical conduit, each of said feed means being spaced approximately 180° from each other and at least one substantially planar partition rotatably mounted in

said cylindrical conduit in said distal end thereof, the plane of said partition being parallel with the axis of said cylindrical conduit and the edges of said partition each terminating sufficiently close to the inside wall of said cylindrical conduit to



prevent extrudable fluid from flowing around said edges wherein said discharge end of said first cylindrical conduit communicates with the inlet end of an end feed, flat extrusion nozzle.

3,909,171

APPARATUS FOR APPLYING INDICIA TO WEBS OF PHOTOGRAPHIC PAPER OR THE LIKE

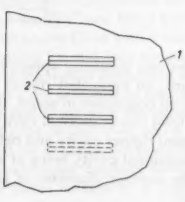
Klaus Weber; Wolfgang Zahn, both of Munich; Friedrich Hujer, Grunwald, and Siegfried Beier, Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 19, 1973, Ser. No. 398,847

Claims priority, application Germany, Sept. 22, 1972, 2246670

Int. Cl.² B29C *3/06*

U.S. Cl. 425—135 **23 Claims**



1. Apparatus for identifying selected portions of a web of photographic paper of the type having a first side provided with a photosensitive layer and a second side, comprising guide means for supporting a web, whose temperature at least approximates the ambient temperature, so that one side of a selected portion of the web remains exposed; a marking tool reciprocable with respect to said guide means between a retracted position and an operative position in which a portion thereof penetrates into the one side of the selected web portion in said guide means whereby said portion of said tool subjects the selected portion to the action of a deforming force which produces in the one side of the web an indicium in the form of at least one recess which is sufficiently deep to be detectable by mechanical scanning means; and means for moving said tool between said positions thereof.

3,909,172

ELECTRICAL CONTROL OF MACHINES

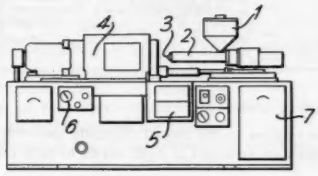
George Thomas Collins, Sutton Coldfield, England, assignor to British Industrial Plastics Limited, Manchester, England

Continuation of Ser. No. 6,720, Jan. 29, 1970, abandoned. This application Feb. 8, 1972, Ser. No. 224,531

Claims priority, application United Kingdom, Jan. 27, 1969, 4895/69

Int. Cl.² B29F *1/00*

U.S. Cl. 425—162 **2 Claims**



1. In an injection moulding machine having hydraulically controlled parts for performing a plurality *m* of possible injection moulding actions, a main control console wired for all *m* possible actions which the machine may be required to perform, and transducer means for producing output signals in response to the performance of said actions, the improvement comprising the combination of control means for selecting different combinations of said *m* possible actions wherein each combination involves a number of actions less than *m* and for controlling the order and timing of such selected combination of actions; said control means comprising:

rack means for removably receiving different combinations of printed circuit cards, said rack means including separate sets of edge connectors associated with the different actions to be performed, each set being adapted to connect with an individual printed circuit card and each set including input and output connectors connected to said main control console and to said transducer means through the associated individual printed circuit card to perform a different one of said plurality *m* of possible injection moulding actions; and

a plurality *n* of printed circuit cards connected with a selected number *n* of said individual sets of said edge connectors, the number *n* being less than *m* and corresponding to the number of actions involved in a selected one of said different combinations of said *m* possible actions each printed circuit card including circuit means for controlling the timing of a certain one of said *n* actic ns, and said printed circuit cards being connected to those *n* corresponding sets of said edge connector which will effect the combination, order and timing of said selected *n* actions.

3,909,173

INJECTION MOULDING MACHINE

Geoffrey Latter, Rexdale, Canada, assignor to A. C. Hamilton & Co., Mississauga, Canada

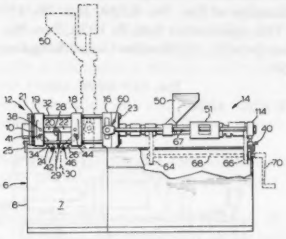
Filed Mar. 30, 1973, Ser. No. 346,683

Int. Cl.² B29F *1/00, 1/02*

U.S. Cl. 425—192 **7 Claims**

1. An injection moulding machine comprising a frame, a mould clamping assembly rigidly mounted on said frame, an injection assembly, means for pivotally securing one end of said injection assembly for angular movement of said injection assembly relative to the mould clamping assembly through 90°, and means for vertically adjusting the pivotal securing means for lateral adjustment of the longitudinal axis of the injection assembly relative to the mould clamping assembly

when said assemblies are arranged in parallel alignment and for axially adjusting the injection assembly along its longitudinal axis relative to the mould clamping assembly when said assemblies are arranged at right angles to each other.

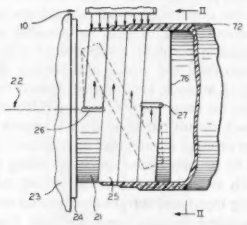


3,909,174

CONTINUOUS TUBE FORMING BY MELT BLOWING TECHNIQUE

Eugene R. Blair, and Robert E. Page, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Dec. 26, 1973, Ser. No. 427,704
Int. Cl.² B29D *23/08*
U.S. Cl. 425—224 **2 Claims**



1. Apparatus for continuously making a tube of melt blown microfibers comprising

a. a mandrel, having a chamber defined interiorly thereof,

b. support means supporting said mandrel in the region of one end thereof,

c. a pair of apertures formed in circumferential portions of said mandrel in generally axially spaced relationship to each other and communicating with said chamber,

d. a continuous flexible belt member, said belt member

1. being spirally wrapped about circumferential portions of said mandrel between said pair of apertures and adapted to make slidable engagement with said wrapped circumferential portions,

2. extending slidably through each of said apertures at opposite ends of said wrapped circumferential portions,

3. being interconnected with itself through said chamber between said apertures,

e. belt drive means including guide means within said chamber and adapted to move continuously said belt longitudinally thereof and spirally about said wrapped circumferential portions in a direction away from said one end,

f. means for continuously generating a generally planar configuration of melt blown microfibers, said means being positioned and adapted to deposit longitudinally upon said wrapped circumferential portions a web of melt blown microfibers,

g. means for continuously collecting generally axially from the opposite end of said mandrel a tubular web of microfibers formed on said belt over said flexible felt member as said belt member so moves and as said microfibers are being so deposited thereon by said generating means, said collecting means comprising a spindle rotatable on its axis and adapted to wind convolutely upon circumferential surface portions thereof in a collapsed, flattened form such tubular web, the axis of said spindle extending generally through, and being generally normal to, the axis of said mandrel and in spaced relationship to said opposite end thereof, said spindle being further adapted to rotate end-over-end generally about the axis of said mandrel,

h. collecting drive means adapted to rotate said spindle end-over-end at a rate approximating the radial speed of said flexible belt member over said circumferential portions,

i. spindle drive means adapted to rotate said spindle on its axis at a rate approximating the axial speed of said flexible belt member over said circumferential portions, and

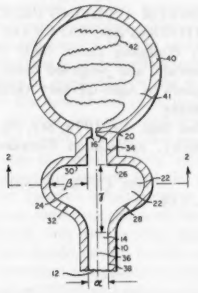
j. roller means adapted to collapse and flatten such tubular web before such is so convolutely wound upon said spindle, said roller means being adapted to rotate with said spindle about the axis of said mandrel as said spindle rotates.

3,909,175

INJECTION MOULDING RUNNER AND PROCESS

Robert George Gemmill, Brampton, Canada, assignor to Du Pont of Canada, Limited, Montreal, Canada

Filed Mar. 8, 1973, Ser. No. 339,423
Int. Cl.² B29C *1/00*
U.S. Cl. 425—242 R **9 Claims**



1. In an injection moulding apparatus comprising polymer injection means, an elongated runner cavity, a gate land, a gate, and a mold connected in series, the improvement which comprises at least one additional cavity appended to the side of said elongated runner cavity and being open to said runner cavity, said additional cavity being at a maximum distance of three times the average diameter of said runner cavity from said gate land.

3,909,176

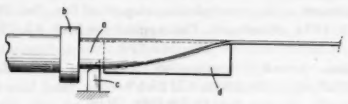
DEVICE FOR THE MANUFACTURE OF BANDS REINFORCED WITH LONGITUDINAL WIRES

Nino Madonini, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Division of Ser. No. 314,984, Dec. 14, 1972, Pat. No. 3,851,033. This application May 3, 1974, Ser. No. 466,772
Claims priority, application Italy, Dec. 17, 1971, 32525/71
Int. Cl.² B29C *17/14*
U.S. Cl. 425—305 **2 Claims**

1. In an apparatus adapted to extrude a wire reinforced elastomeric tube, split the tube longitudinally and flatten the split tube, means for supporting the cut tube as it is flattened and to thereby maintain its reinforcing wires at a constant distance from one another during its passage from tubular to

flat form, said support means having the contour of an arrangement of a plurality of wires equally spaced circumferentially from each other at one end around a circle and equally spaced along a straight line and weighted at the other end to



subject the wires to tension, said wires being connected to each other at spaced points between said ends by elastic members under flexion, the planes of the circle, the straight line and the elastic members lying on planes parallel to each other.

3,909,177

APPARATUS FOR MANUFACTURING POLYOLEFIN-INSULATED CABLES

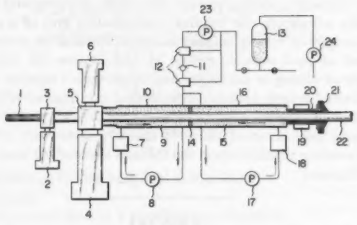
Michio Takaoka; Hiroto Oshima; Toshiharu Katsuhara; Motoyuki Ono; Hideo Sano, all of Suzuka; Masaichiro Seki, and Masakazu Hasegawa, both of Tokyo, all of Japan, assignors to The Fujikura Cable Works, Ltd., Tokyo, Japan

Filed Aug. 29, 1974, Ser. No. 501,834

Claims priority, application Japan, Aug. 30, 1973, 48-97726

Int. Cl.² B29H *5/28*

U.S. Cl. 425—384 **4 Claims**



1. An apparatus for manufacturing electric conducting cables insulated with a hardened polyolefin which comprises a tube partitioned into a heating zone filled with a heat transfer medium and a cooling zone filled with a cooling medium, separate circulation systems for said heat transfer and cooling media, a pressure regulating means connected to each of said circulation systems, and a die arranged in alignment just after the outlet of said tube and filled with the same cooling medium as in said cooling zone of said tube, and a super-cooling means connected to said die to supercool said cooling medium therein so that the supercooled medium works to seal the clearance between the outer surface of a passing insulated cable core and the inner wall surface of the passage in said die.

3,909,178

MOLD FOR MAKING FLUID CONTAINING STRUCTURE

Benjamin Ross, 300 N. State St., Chicago, Ill. 60610

Division of Ser. No. 194,887, Nov. 2, 1971, Pat. No. 3,849,814.

This application May 20, 1974, Ser. No. 471,344

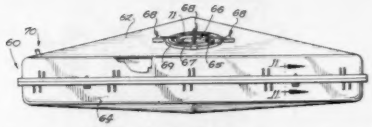
Int. Cl.² B29C *5/04;* **B29H** *3/00;* **B21D** *39/02*

U.S. Cl. 425—425 **10 Claims**

1. A sheet metal mold for use on a rotational molding machine in a process for the manufacture of a seamless water bed mattress structure capable of containing liquid, said mold comprising:

a. a first sheet metal portion, said first portion having the shape and proportion of the top half of a water bed mattress and having a domed configuration on the top surface thereof;

b. a second sheet metal portion peripherally conforming to said first portion and having the shape and proportion of the bottom half of a water bed mattress, said second portion being attached to the first portion to form a hollow enclosure therewith, the juncture of the first and second portions forming a smooth seam in the interior of the enclosure which will not form an objectionable part-



ing line on said liquid-containing structure at the point where the mold portions are joined;

c. hatch means in one of said portions for providing access to the interior of the mold without separating the two portions of said mold;

d. means for continuously venting said mold; and

e. means for attaching said mold to a continuously rotating molding machine.

3,909,179

BI-AXIALLY ROTATIONAL SYNTHETIC RESIN MOLDING MACHINE

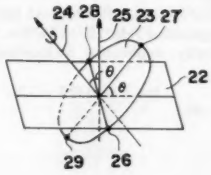
Yasuaki Chujoo, Kodaira, and Jisaku Miyaji, Ichikawa, both of Japan, assignors to Funabashi Kasei Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1972, Ser. No. 305,788

Claims priority, application Japan, May 26, 1972, 47-51695

Int. Cl.² B29C *5/04*

U.S. Cl. 425—429 **10 Claims**



1. A bi-axially rotatable molding machine, comprising a rotary platform mounted for rotation about a first axis disposed at a predetermined angle with respect to the vertical, the platform including a mold supporting surface thereon adapted to revolve in a plane inclined with respect to the horizontal at an angle less than 90°, means for revolving said rotary platform about said first axis, a hollow mold rotatably mounted on said mold supporting surface for rotation about a second axis disposed perpendicular relative to said first axis, said hollow mold capable of being charged with a material to be molded and having a final product withdrawn therefrom, a plurality of supporting rollers mounted on said rotary platform for supportingly engaging the circumference of said hollow mold, means for rotating said hollow mold about said second axis.

3,909,180

AUTOMATIC MOLD LOCK

John W. Von Holdt, 7430 N. Croname Rd., Niles, Ill. 60648

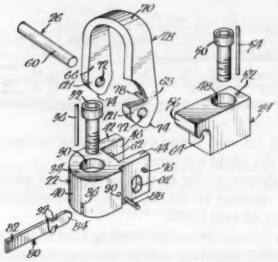
Filed Aug. 7, 1974, Ser. No. 495,318

Int. Cl.² B29C *1/16*

U.S. Cl. 425—451.9 **21 Claims**

1. A mold parting-line lock for use in hoisting and locking together two separable sections of a mold, comprising an

anchor member adapted to engage one of the sections, a retainer member adapted to engage the other of the sections, locking means for locking said sections together, and hoist



bolt means for hoisting the sections and automatically locking said locking means when the sections are hoisted by said hoist bolt means.

3,909,181
EXTRUSION NOZZLE

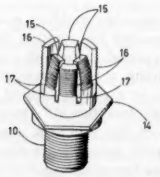
Jean-Jacques Wuhrmann, Vevey, and Paul van de Rovaart, Chexbres, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 225,770, Feb. 14, 1972, abandoned. This application Feb. 12, 1974, Ser. No. 441,768

Claims priority, application Switzerland, Feb. 19, 1971, 2429/71

Int. Cl.[2] B28B *21/52*

U.S. Cl. 425—461 **4 Claims**



1. An extrusion nozzle for extruding proteinaceous material in a doughlike mass thereof, said nozzle comprising an elongated body having a cylindrical wall portion enclosing space defining an axial passage, and an even numbered plurality of fins of arcuate cross section extending longitudinally from said cylindrical wall portion, said fins being circularly spaced about the longitudinal axis of said passage, tip end portions of alternate ones of said fins being turned inwardly relative to the remaining fins toward said longitudinal axis, said remaining fins extending in substantially straight disposition from said cylindrical wall portion.

3,909,182
APPARATUS FOR PROTECTIVELY COVERING CONTAINER NECKS

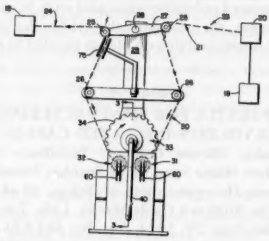
Dusan S. Lajovic, Smithfield, Australia, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 75,840, Sept. 28, 1970, abandoned, and a continuation-in-part of Ser. No. 194,253, Nov. 1, 1971, abandoned. This application Mar. 12, 1973, Ser. No. 340,293

Claims priority, application Australia, Oct. 2, 1969, 61800/69; Oct. 13, 1969, 62213/69

Int. Cl.[2] B29D *17/16*

U.S. Cl. 425—510 **15 Claims**



1. In automatic apparatus for applying covering elements of heat shrinkable synthetic plastics material upon externally threaded articles, means for successively positioning articles at an element applying station, means for gripping and longitudinally advancing the tubular open leading end of a continuous length of tubing of said material toward an article positioned at said station, means at said station for severing a length of tubing at said open end to provide a tubular element of desired length separated from said continuous tubing and positioned in axial alignment with said article, and means for pushing said severed element directly onto said article in surrounding relation upon the threads thereof for heat shrinking thereon.

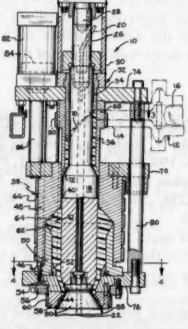
3,909,183
PARISON EXTRUSION HEAD

John S. Hsu, Somerville, N.J., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Mar. 18, 1974, Ser. No. 451,836

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—466 **9 Claims**



1. An extrusion head for extruding a tube of plastic material comprising a die mandrel, a die body enclosing said die man-

drel to define therewith an annular outlet orifice, an annular inlet orifice and an annular accumulation chamber in communication with and located between said inlet and outlet orifices, a diverter supported on said die mandrel and having an inlet port for receiving plastic material from an extruder and defining with said die mandrel an annular outlet port in communication with said annular inlet orifice for passage of the plastic material from said extruder to said accumulation chamber, said die body being axially expansible and contractible for expanding and contracting the volume of said accumulation chamber so that plastic material can be received through said inlet orifice and accumulated in said chamber when said die body is expanded and can be discharged through said outlet orifice when said die body is contracted.

3,909,184

FLAME CONTROL IN FURNACE BURNERS

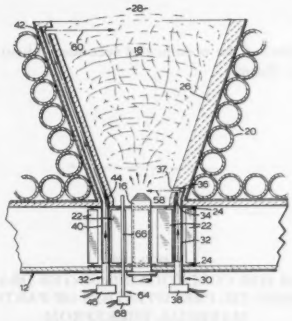
Arnold M. Earl, 1325 Applewood Rd., Mississauga, Ontario, Canada (L5E 2L9)

Filed Oct. 15, 1974, Ser. No. 514,424

Claims priority, application Canada, Oct. 15, 1973, 183315.

Int. Cl.² F23N *5/08*

U.S. Cl. 431—75 **3 Claims**



1. Apparatus for burning fuel comprising
   a. a boiler,
   b. said boiler having a combustion chamber,
   c. said combustion chamber having a principal combustion area and a throat through which fuel and air enter said principal combustion area, said throat having refractory walls,
   d. means for admitting fuel through said entry throat to said combustion area,
   e. means at said entry throat for the controlled admitting of said air through said entry throat to said principal combustion area in a direction rotationally and/or longitudinally of said throat,
   f. flame sensing means in said throat for sensing the light from the apex of combustion in the direction that extends transversely of said entry throat, and
   h. control means responsive to said flame sensing means for controlling the forward velocity of air admitted by said means for admitting air.

3,909,185

GAS BURNER

Hilmar Vits, Huschelrath 16, Germany, assignor to Vits-Maschinenbau GmbH, Langenfeld, Germany

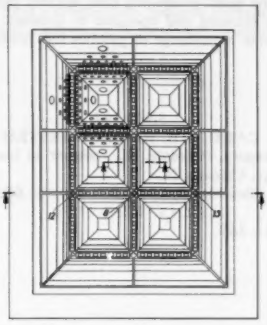
Filed July 29, 1974, Ser. No. 492,918

Claims priority, application Germany, Sept. 1, 1973, 2344220

Int. Cl.² F23C *7/02*

U.S. Cl. 431—190 **6 Claims**

1. A gas burner comprising a row of a plurality of gas nozzles, gas supply means coupled to said nozzles, a plurality of rows of air nozzles extending on both sides of said row of gas nozzles parallel thereto, said air nozzles and gas nozzles having respective discharge axes which lie in intersecting planes and air supply means coupled to said air nozzles for supplying the same with air at a uniform pressure, said rows of air nozzles being symmetrically distributed with respect to said row of gas nozzles and arranged so that the number of air nozzles in each row decreases from row to row in correspondence with increase of distance from the row of gas nozzles, the air nozzles in symmetrical rows on opposite sides of the row of gas nozzles being in confronting relation and having intersecting directions of discharges and uniform cross-sectional discharge areas, the cross-sectional discharge area of the air nozzles increasing in successive rows in correspondence with their increase in distance from the row of gas nozzles.



3,909,186

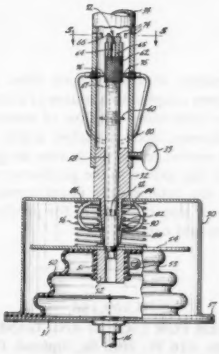
IGNITER MECHANISM

Walter H. Kidwell, Rt. 1, Naches, Wash. 98903, and Walter Scott Kidwell, 4807 55th Ave. South, Seattle, Wash. 98118

Filed May 13, 1974, Ser. No. 469,350

Int. Cl. F23q *1/04*

U.S. Cl. 431—254 **6 Claims**



1. An igniter mechanism for association with the nozzle of a gaseous fuel burner for a space heater, comprising:
   a valved supply line for gaseous fuels;
   means forming an expansible/ contractible chamber in communication with said supply line to be expanded upon the occurrence of gaseous fuel under pressure in said supply line;
   an elongated stem communicably associated with said expansible chamber, said stem terminating in a fuel discharge orifice;

abrader means carried by said stem in close proximity to said discharge orifice;

releasible clutch means surrounding and engageable with said elongated stem when said espansible element is non-expanded;

means operable upon a predetermined degree of expansion of said expansible member to release said clutch means to permit forcible movement of said elongated stem; and

at least one spark-producing flint forcibly pressed to said abrader element and operable to produce a shower of sparks into a discharge of gaseous fuel from said orifice.

3,909,187

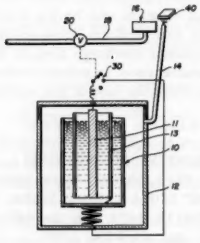
CATALYTIC IGNITION SYSTEM

Derek P. Gregory, Hinsdale, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed May 3, 1974, Ser. No. 466,683

Int. Cl.[2] F23Q *11/04*

U.S. Cl. 431—268 **25 Claims**



1. In combination with a catalytic pilot ignition system having a gas burner coupled to a source of natural gas, control valve means for controlling the flow of natural gas from the source to the burner, and a catalyst active with hydrogen positioned with respect to the gas burner to ignite the natural gas flowing from the source to the gas burner when hydrogen is impinged on the catalyst, the improvement comprising a short-circuited, air starved, battery for producing the hydrogen impinged on said catalyst.

3,909,188

FUEL BURNER FOR LIQUID AND GASEOUS FUELS

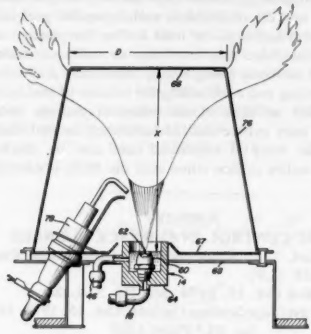
Wallace W. Velie, 616 W. 20th St., Upland, Calif. 91786

Continuation-in-part of Ser. No. 282,694, Aug. 22, 1972, Pat. No. 3,847,537. This application Feb. 12, 1974, Ser. No. 441,837The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

Int. Cl.[2] F23D *11/10*

U.S. Cl. 431—285 **27 Claims**

1. An air-atomizing fuel burner system comprising air-atomizing nozzle means for using primary gas under pressure to disperse fuel, means for delivering liquid fuel to said air-atomizing nozzle means, means for delivering gaseous fuel to said air-atomizing nozzle means, means for selecting the type of fuel delivered to said air-atomizing nozzle means, and means for delivering primary gas under pressure to said air-atomizing nozzle means to disperse said fuel so that the dispersed fuel



can be ignited in the presence of secondary air to produce a combustion flame.

3,909,189

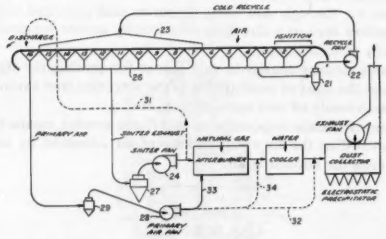
PROCESS FOR CONDITIONING SINTER DRAFT FOR ELECTROSTATIC PRECIPITATION OF PARTICULATE MATERIAL THEREFROM

Thomas E. Ban, South Euclid, Ohio, assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 174,714, Aug. 25, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 303,953

Int. Cl.[2] F27B *15/12*

U.S. Cl. 432—16 **10 Claims**



1. In a process for sintering a bed of particulate mineral material mixed with combustible carbonaceous material and water while moving the bed on a traveling grate and while burning the carbonaceous material in the bed to supply heat thereto, wherein carbonaceous material in the bed adjacent one surface thereof is ignited during a first portion of its travel

and combustion thereof progressively through the bed is thereafter maintained during its continued travel through an elongate combustion zone by passing oxidizing gases into the bed over the length of said combustion zone and exhausting from the bed the gaseous products of combustion of said carbonaceous material together with entrained combustible matter derived from the bed that includes a substantial amount of hydrocarbons, the exhaust gases from an initial portion of the length of said combustion zone also entraining and removing a major portion of the initial water content of the bed; the improvement comprising collecting the exhaust gases and entrained matter exhausted from the bed along said initial portion of said combustion zone and recycling the same into the bed along a subsequent portion of said combustion zone to incinerate the entrained combustible matter within the bed while withdrawing exhaust gases from the bed along said subsequent portion of the combustion zone, whereby the latter exhaust gases from the subsequent portion of said combustion zone have a substantially reduced content of combustible matter and a substantially increased moisture content.

3,909,190

HAIR DYEING PROCESS AND COMPOSITION CONTAINING α-CYANO-METHANESULFONAMIDO-NITROBENZENE DERIVATIVES

Ferdi Saygin, Dusseldorf, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf, Germany

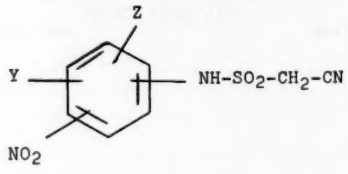
Filed Aug. 16, 1973, Ser. No. 388,728

Claims priority, application Germany, Aug. 21, 1972, 2241015

Int. Cl.[2] A61K 7/13

U.S. Cl. 8—10.1 8 Claims

1. An aqueous preparation for the direct dyeing of human hair consisting essentially of (1) from 0.1% to 5% by weight of an α-cyano-methanesulfonamido-nitrobenzene compound having the formula



wherein Y is a member selected from the group consisting of hydrogen, chloro, bromo and alkoxy having 1 to 4 carbon atoms, and Z is a member selected from the group consisting of amino and hydroxyl; (2) from 0% to 30% by weight of a surfactant selected from the group consisting of an anionic wetting agent and a nonionic wetting agent; (3) from 0% to 25% by weight of a thickener; and (4) from 40% to 99.9% by weight of water.

3,909,191

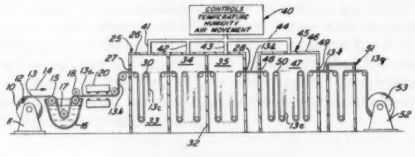
COLD GELATIN DYE IMPREGNATION AND SUB-GELATION WARMING TO SET DYE

Lyle E. McCoy, 533 N. Whitehall Rd., Norristown, Pa. 19401

Filed May 25, 1973, Ser. No. 363,985

Int. Cl. D06p 1/68

U.S. Cl. 8—87 8 Claims



1. In the method of dyeing textiles, the steps which comprise: preparing a mixture of dye, gelatin and solvent in which the gelation temperature of the gelatin is above the freezing temperature of the solvent; applying the mixture to textile material; maintaining the applied mixture at a temperature between said gelation and freezing temperatures; removing the solvent from the mixture to raise the gelatin concentration and gelation temperature; raising the maintained temperature of said mixture below said gelation temperature as the latter increases to accelerate removal of solvent; applying heat to complete dye reaction; and removing gelatin from the textile.

3,909,192

STABLE LIQUID DYESTUFF PREPARATIONS

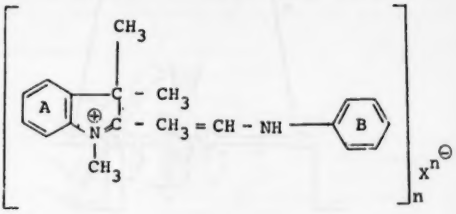
Berthold Gertisser, Muenchenstein, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 215,081, Jan. 3, 1972, abandoned. This application Aug. 23, 1972, Ser. No. 283,084

Int. Cl. D06p 1/68

U.S. Cl. 8—90 8 Claims

1. A stable liquid dyestuff composition comprising 20 to 25% by weight of a basic dyestuff salt of the formula



in which

X^n is the anion of an inorganic acid or an alkylsulphuric acid in which the alkyl radical contains 1 to 4 carbon atoms,

ring A is unsubstituted or substituted by one or more non-water solubilizing substituents selected from the group consisting of halo, nitro, amino, cyano, thiocyano, hydroxyl, alkyl, alkoxy, trifluoroalkyl, trichloroalkyl, phenyl, phenylalkyl, phenoxy, alkylamino, dialkylamino, phenylamino, urethane, alkylsulphonyl, phenylsulphonyl, sulphonamido, alkylsulphonamido, dialkylsulphonamido, phenylsulphonamido, phenylazo, diphenylazo and naphthylazo, any alkyl portion of said substituents containing 1 to 6 carbon atoms and being unsubstituted or substituted by halo, hydroxyl or cyano,

ring B is unsubstituted or substituted by alkoxy of 1 to 6 carbon atoms, and

n is 1, 2 or 3,

3 to 20% by weight of γ-butyrolactone, 58 to 74% by weight of benzoic acid or a water-soluble aliphatic carboxylic acid of 1 to 6 carbon atoms and 0 to 16% by weight water.

3,909,193

TANNING FORMULATIONS

Hans Erdmann, Heidelberg, and Franz Friedrich Miller, Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 28, 1973, Ser. No. 345,506

Claims priority, application Germany, Apr. 1, 1972, 2215948; June 7, 1972, 2227598; Sept. 7, 1972, 2243826

Int. Cl.[2] C14C 3/16

U.S. Cl. 8—94.33 3 Claims

1. A tanning composition comprising a reaction product obtained by the process of reacting 1 molar portion of (A) a $C_{2-8}\omega,\omega'$-dialdehyde or the complete acetal of said dialdehyde of which the alcohol component contains from 1 to 10 carbon atoms, or an amount of a mixture of said $C_{2-8}\omega,\omega'$-dialdehydes or said acetals equivalent to 1 molar portion, in the form of a 25 to 50% w/w aqueous solution, with (B) 4 to 6 molar portions of formaldehyde, in the form of a 30 to 40% w/w aqueous solution, for from 30 to 120 minutes at 80° to 95°C and at a pH of from 6.5 to 10 in the presence of from 5 to 20% by weight, based on said dialdehyde of at least one trialkanol amine having from 2 to 4 carbon atoms in each alkanol group.

3,909,194

BLEACHING OF TEXTILES WITH CHLORINE MONOXIDE

Norman Liebergott, Laval, and Henry I. Bolker, Pointe Claire, both of Canada, assignors to Pulp and Paper Research Institute of Canada, Canada

Filed May 16, 1973, Ser. No. 360,974
Claims priority, application Canada, May 30, 1972, 143425
Int. Cl.² D06L 3/06
U.S. Cl. 8—108 23 Claims

1. In a process for the bleaching of textile materials, either in open-width or rope form, and at a suitable moisture content, the improvement which comprises contacting said textile materials with chlorine monoxide in admixture with an inert gaseous or liquid carrier.

3,909,195

PROCESS OF MODIFYING TEXTILE MATERIALS WITH POLYMERIZABLE MONOMERS

Greville Machell, and Manuel A. Thomas, both of Spartanburg, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 6, 1962, Ser. No. 242,603
Int. Cl.² D06M 15/36, 15/38, 15/32
U.S. Cl. 8—115.7 10 Claims

1. A novel process for reacting textile fibers with ethylenically unsaturated compounds comprising:

1. providing an ethylenically unsaturated compound-containing liquid medium;
2. providing textile fibers, the weight ratio of the liquid medium to the textile fibers being between about 8/1 and about 20/1;
3. forcing said liquid medium back and forth through said textile fibers in the presence of a chemical, textile fiber reaction promoting catalyst;
4. and withdrawing said textile fibers from said liquid medium after permitting the desired degree of reaction to occur; said textile fibers comprising keratinic fibers, cellulosic fibers or blends of either keratinic or cellulosic fibers with acrylic fibers, synthetic polyamide fibers or synthetic polyester fibers.

3,909,196

PROCESS AND DEVICE FOR THE IMPREGNATION AND DRYING OF TEXTILE MATERIAL

Walter Birke; Hans-Ulrich von der Eltz, and Franz Schon, all of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 1, 1972, Ser. No. 302,853
Claims priority, application Germany, Mar. 25, 1972, 2214714; Sept. 23, 1972, 2246760; Sept. 23, 1972, 2246781; Sept. 23, 1972, 2246889
Int. Cl.² D06C 7/04
U.S. Cl. 8—140 22 Claims

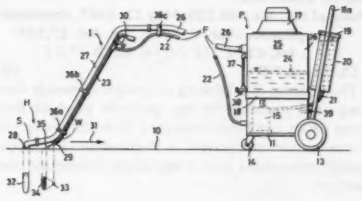
1. A process for the impregnation of a textile material with a textile treating agent and subsequent drying of the textile material comprising treating the textile material with an impregnating bath, said bath consisting essentially of a textile treating agent and an inflammable organic liquid, and drying said textile material by burning off the liquid.

3,909,197

METHOD AND APPARATUS FOR CLEANING TEXTILE FLOOR COVERING

Johann Heinrich Cremers, Marienburger Str, 24, 5039 Rondorf near Cologne, Germany

Filed Aug. 24, 1973, Ser. No. 391,191
Claims priority, application Germany, Sept. 7, 1972, 2244881
Int. Cl.² B08B 5/04
U.S. Cl. 8—158 3 Claims



1. A method for in situ cleaning carpeting or textile floor covering comprising the steps of

high-pressure jet-spraying water at a pressure of from about 31 to 36 atmospheres on and thereby into the carpeting to be cleaned with the water jet flow being a rapidly pulsating flow,

and immediately thereafter vacuum suctioning off from and out of the carpeting the major part of the applied water and dirt contained therein.

2. The method as described in claim 1, wherein the jet-sprayed water is split up into a plurality of fan-spread thin sprays, the water being pulsatingly delivered with a pulsation frequency of from 720 to 1440 per minute.

3. The method as described in claim 2, wherein the water is sprayed on the carpeting at a temperature below about 60°C.

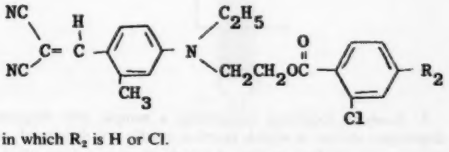
3,909,198

POLYESTER MATERIAL DYED WITH YELLOW METHINE DYES

Edgar Earl Renfrew, and Henry Wolfgang Pons, both of Lock Haven, Pa., assignors to American Aniline Products, Inc., Charlotte, N.C.

Filed June 28, 1973, Ser. No. 374,773
Int. Cl. D06p 3/52
U.S. Cl. 8—179 3 Claims

1. A polyester textile material dyed with a compound of the formula:



in which R_2 is H or Cl.

3,909,199

CATALYST ASSIST AGENTS USING LEAVING GROUP EFFECTS

Sidney L. Vail, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 267,312, June 29, 1972, Pat. No. 3,771,957. This application Apr. 6, 1973, Ser. No. 348,559
Int. Cl.² D06M 13/34
U.S. Cl. 8—181 4 Claims

1. A composition for crosslinking cellulosic-containing textiles, said composition comprising

a. dimethyloldihydroxyethyleneurea,
b. a catalyst selected from the group consisting of magnesium chloride and zinc nitrate, and
c. N-acetoxymethyl methyl carbamate.

3,909,200

USE OF GUANIDINE DERIVED COMPOUNDS AS CORROSION INHIBITORS

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 640,329, May 22, 1967, abandoned. This application Apr. 9, 1970, Ser. No. 27,137
Int. Cl.² C23F *11/14*; E21B *43/22*
U.S. Cl. 21—2.7 R **10 Claims**

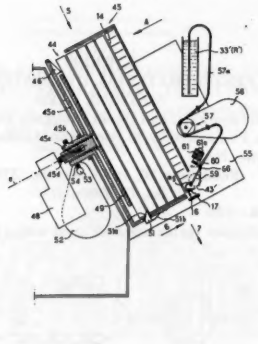
1. The process of inhibiting corrosion of metals comprising treating said metals with the polymer product formed by reacting (A) a compound selected from the group consisting of a cyanamide compound, a dicyandiamide compound, a guanidine compound and a biguanide compound and (B) a polyamine.

3,909,201

ANALYSIS APPARATUS

Claude Matte, Paris, France, assignor to Centre National de Transfusion Sanguine, Paris, France

Filed July 9, 1973, Ser. No. 377,297
Claims priority, application France, Mar. 22, 1973, 73.10393; July 13, 1972, 72.25541
Int. Cl.² G01N *31/00*
U.S. Cl. 23—253 R **21 Claims**



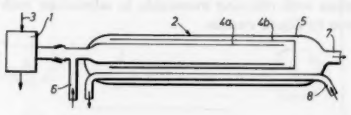
1. Analysis apparatus comprising a sample and reagent dispensing station at which reaction media are dispensed; a reaction observation station at which reaction taking place between said sample and said reagent can be observed; a plurality of supports of planar configuration, each said support including a plurality of micro-containers for individually receiving, at said dispensing station, a predetermined quantity of liquid sample to be analysed and a predetermined quantity of liquid analysis reagent; and transfer means for transferring said supports from said dispensing station to said reaction observation station, said transferring means including means for supporting each said support so that the plane of the support forms an acute angle with respect to the vertical and for imparting to each said support a low speed rotation in said plane about an axis of rotation perpendicular to the plane of said support.

3,909,202

APPARATUS FOR ANALYSIS OF LIQUIDS

Wolf-Jürgen Becker; Franz-Josef Schulte, both of Leverkusen, and Klaus Siemer, Schildgen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Erdolchemie Gesellschaft mit beschrankter Haftung, Cologne, both of, Germany

Filed Dec. 5, 1973, Ser. No. 422,059
Claims priority, application Germany, Dec. 15, 1972, 2261449
Int. Cl.² G01N *25/24*, *31/12*
U.S. Cl. 23—253 PC **7 Claims**



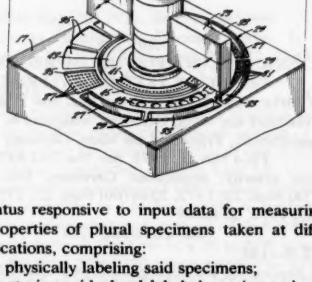
1. An apparatus for the analysis of samples of a liquid comprising:
a. a combustion furnace comprising several tubes arranged one inside the other for passage of the sample serially through the tubes, during the combustion,
b. an injection valve having a bore for continuous flow of a stream of the liquid through the valve, an outlet for discharge of the sample from the stream, means for opening and closing said outlet for the discharge of the sample, the injection valve being connected to the combustion furnace for injection of the sample into the combustion furnace,
c. a carrier gas inlet pipe connected to the combustion furnace for introducing the carrier gas into the furnace so that the carrier gas carries the sample through the combustion furnace,
d. an analyzer connected to the outlet of the combustion furnace.

3,909,203

ANALYSIS SYSTEM HAVING RANDOM IDENTIFICATION AND LABELING SYSTEM

Robert R. Young, Anaheim; Patrick L. Randleman; Roger C. Wilborn, both of Brea, and Stanley J. Andrzejewski, Buena Park, all of Calif., assignors to Anatronics Corporation, Anaheim, Calif.

Filed Aug. 4, 1974, Ser. No. 447,941
Int. Cl.² G01N *33/16*, *1/10*
U.S. Cl. 23—253 R **24 Claims**



1. Apparatus responsive to input data for measuring the chemical properties of plural specimens taken at different times and locations, comprising:
means for physically labeling said specimens;
means for storing said plural labeled specimens in an indexed array, said indexed array having a predetermined order;
means mounted on said storing means for reading said label on each of said specimens to produce identification data;

means responsive to index sequencing input data for moving said reading means to specified locations within said indexed array;

first register means for storing in correlated register locations said identification data and said index sequencing input data for each operation of said reading means;

second register means for storing in correlated register locations input identification data relating to each of said specimens and input data indicative of selected chemical processes to be performed on selected ones of said specimens; and

comparator means responsive to said first register means and said second register means for comparing the identification data of said registers to produce output data corresponding to the selected tests to be conducted on specimens at selected locations in said indexed array.

3,909,204

GAS POLLUTION MONITOR

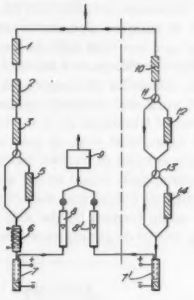
John Douglas Allen, Surrey, England, assignor to British Gas Corporation, London, England

Filed Sept. 4, 1973, Ser. No. 393,958

Claims priority, application United Kingdom, Sept. 21, 1972, 43823/72

Int. Cl. G01n *27/30*

U.S. Cl. 23—254 E **7 Claims**



1. Apparatus for measuring low concentrations of nitrogen oxides and carbon monoxide in a gas which apparatus includes means for receiving the gas to be treated, means for providing two separate streams of the gas to be tested, means for removing interfering gases from a first of the two streams, means for reacting the carbon monoxide present in the first stream with a iodine pentoxide compound to produce correspondingly quantitative amounts of iodine, a galvanic cell associated with each stream and comprising a platinum cathode in contact with a neutral buffered halide electrolyte in which is immersed an active carbon or silver anode, means for causing said iodine pentoxide containing first stream and said second stream to flow over the cathode of its associated cell, means for measuring the rate of flow of each stream through its associated cell and means for measuring the current from each cell when its associated stream passes through it.

3,909,205

LIQUID TRANSFER SYSTEM

Robert H. Jones, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed July 16, 1973, Ser. No. 379,715

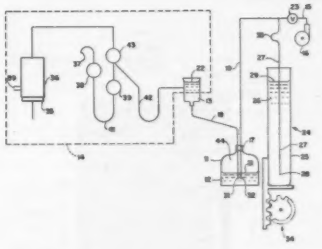
Int. Cl. B01l *11/00;* **G01n** *1/00*

U.S. Cl. 23—259 **8 Claims**

1. In apparatus for transferring liquid from a storage vessel containing liquid to a liquid-containing reservoir having means for withdrawing liquid from the reservoir, the reservoir being located above the storage vessel, the apparatus also maintaining the level of said liquid in the reservoir at a substantially constant level as liquid is withdrawn therefrom, the improvement comprising:

means for closing the storage vessel and forming an air bell above the liquid in the storage vessel,

a liquid supply line connected to the reservoir below the level of liquid therein and extending downward into the storage vessel below the level of liquid in the storage vessel,



a pneumatic pressure supply line extending into the storage vessel below the level of liquid contained therein, and

liquid column means for maintaining in the pressure supply line a pressure head measured in units of liquid height which equals the elevation of the liquid in the liquid reservoir above the lower end of the liquid supply line in the storage vessel.

3,909,206

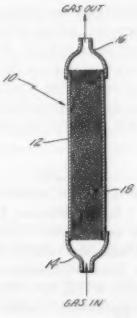
HIGH PERFORMANCE CARBON DIOXIDE SCRUBBER

Murray Katz, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 10, 1974, Ser. No. 459,733

Int. Cl.² B01J *1/22, 7/00;* **B01D** *53/16;* **C01B** *31/20*

U.S. Cl. 23—284 **3 Claims**



1. A scrubber for removing carbon dioxide from a fuel cell reactant gas stream to a concentration of less than one-quarter of a part per million parts comprising:

a container including a gas inlet and a gas outlet; and

a packed bed of particles disposed in said container comprising alkali hydroxide particles no greater than 10 microns in diameter and hydrophobic particles which are inert to water, said hydrophobic particles being of substantially no greater size than said alkali hydroxide particles and being uniformly distributed throughout said alkali hydroxide particles so as to keep a substantial portion of said alkali hydroxide particles separated from one another, said hydrophobic particles comprising be-

tween 10 and 60% by volume of said packed bed of particles.

3,909,207

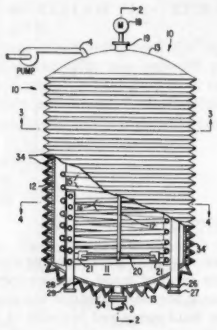
VERTICAL STIRRED MASS POLYMERIZATION APPARATUS

Wallace G. Bir, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 9, 1973, Ser. No. 339,781

Int. Cl.[2] B01J *1/00*; **B01F** *7/16*; **F28F** *13/12*

U.S. Cl. 23—285 **8 Claims**



1. An apparatus adapted for use in continuous bulk polymerization of alkenylaromatic monomers, comprising a vertically oriented generally cylindrical chamber formed by a casing provided with terminal closures and having a monomer input means near its upper end and a polymeric product output means near its lower end, coil means for cooling at least the lower portion of said chamber, a rotatable member positioned along the vertical axis of said chamber comprising a center shaft having a plurality of integral circular horizontally oriented disk members positioned in vertically spaced relationship therealong, each of said disk members having attached at spaced intervals about its circumference a plurality of radially extending flat blade members, the blade members of lowermost disk member being vertically oriented with respect to their flat surfaces and all blade members of the remaining disk members having their flat surfaces oriented at an angle upwardly inclined in the direction of rotation with respect to the plane of said horizontal disk members, and a driving means to provide rotation therein.

3,909,208

APPARATUS FOR HYDROCARBON CONVERSION

Roger Boret, Le Pecq; Charles Bronner, Chatou; Roland Huin, Montesson-la-Borde, and Andre' Vidal, Le Vesinet, all of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Dec. 13, 1972, Ser. No. 314,587

Claims priority, application France, Dec. 17, 1971, 71.45656

Int. Cl. B01j *9/04*, *9/08*; **C10g** *13/00*

U.S. Cl. 23—288 R **9 Claims**

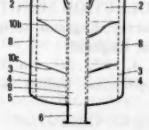
1. An apparatus for converting hydrocarbons in the presence of a catalyst, which comprises a substantially vertical elongated enclosure whose section by a horizontal place is curvilinear, said elongated enclosure containing an annular enclosure for receiving a bed of catalyst, arranged substantially vertically in the elongated enclosure, said annular enclosure being defined between two cylindrical perforated walls, the cylindrical perforated wall which is closer to the walls of the elongated enclosure being referred to as "external wall of the annular enclosure" and the other being referred to as "internal wall of the annular enclosure", said perforated walls being for radial flow of reactants through said annular enclosure, said apparatus comprising:

an internal manifold adjacent to said annular enclosure and comprising the internal space of the elongated enclosure limited by the internal cylindrical wall of said enclosure;

an external feed space adjacent to said annular enclosure and formed of the space limited by the walls of the elongated enclosure and the external cylindrical wall of said annular enclosure;

an inlet communicating with the external feed space adjacent to said annular enclosure for feeding the reactants;

an outlet communicating with the internal manifold adjacent to said annular enclosure for discharging the reaction products;



a screen for impeding any discharge of reactants from said annular enclosure at the top of the internal manifold adjacent to said annular enclosure, said screen having a height of not less than 50% and not more than 400% of the distance between said internal wall and said external wall of said annular enclosure and having the shape of an inverted truncated cone of upwardly increasing section, said inverted truncated cone having the same axis as the internal cylindrical wall of said annular enclosure, the area of the smaller of the two bases of the truncated cone being substantially equal to the area of the cross-section of the internal cylindrical wall of said annular enclosure and the angle formed by the axis of this truncated cone with any one of its generatrices, being not more than 55°.

3,909,209

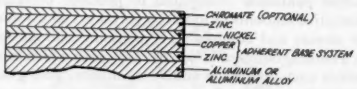
METHOD OF TREATING ALUMINUM AND ALUMINUM ALLOYS AND ARTICLE PRODUCED THEREBY

Wayne A. Kruper, Willowick, and George R. Kingsbury, Mayfield, both of Ohio, assignors to Gould Inc., Chicago, Ill.

Filed Nov. 5, 1973, Ser. No. 412,579

Int. Cl.[2] B23P *3/00*; **C23F** *17/00*; **C25D** *5/44*, *5/48*

U.S. Cl. 29—183.5 **17 Claims**



1. A method of simultaneously rendering, solderable and protected against galvanic corrosion, a clean aluminum or aluminum base alloy surface to which a nickel coat will not adhere, which method consists essentially of applying to said surface an adherent base system which promotes adhesion between said surface and a subsequently applied nickel coat and then rinsing the treated surface, applying to said adherent base system a nickel coat having a thickness within the range of 2.0–200 in.$\times 10^{-6}$ and then rinsing the treated surface; and applying to said nickel coat a zinc coat having a thickness within the range of 1.0–100 in.$\times 10^{-6}$ and then rinsing the treated surface.

10. A method of simultaneously rendering solderable and protected against galvanic corrosion at least one surface of a body selected from the group consisting of aluminum and

aluminum base alloy bodies, to which a nickel coat will not adhere, comprising the steps of:

a. treating said surface with an alkaline solution to clean and etch it,

b. treating said surface with an acidic solution to desmut it,

c. depositing on said surface an adherent base system, which promotes adhesion between said surface and a subsequently applied nickel coat,

d. depositing on said adherent base system a nickel coat having a thickness within the range of about 2.0 to about 200 in.$\times 10^{-6}$, and

e. depositing on said nickel coat a zinc coat having a thickness within the range of about 1.0 to about 200 in.$\times 10^{-6}$.

15. As an article of manufacture, a body formed of a material selected from the group consisting of aluminum and aluminum base alloys to which a nickel coat will not adhere, said body having at least one solderable, galvanic-corrosion resistant surface defined by superposed layers of an adherent base system which promotes adhesion between said surface and a subsequently applied nickel coat, a nickel coat having a thickness within the range of about 9 to about 11 in.$\times 10^{-6}$, and a zinc coat having a thickness within the range of about 18.0 to about 22.0 in.$\times 10^{-6}$.

3,909,210

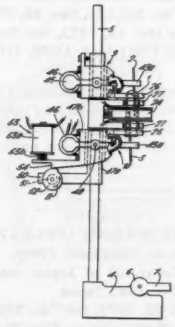
APPARATUS FOR PRODUCING A GLASS-ENCAPSULATED REED CONTACT SWITCH

Theo Huttner, Tegersee, Germany, assignor to The Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 389,615, Aug. 20, 1973, Pat. No. 3,828,427. This application Apr. 17, 1974, Ser. No. 461,557

Int. Cl. H01r *11/00*

U.S. Cl. 29—203 R **3 Claims**



1. An apparatus for producing reed switches comprising: means for holding at least two contacts in spaced relation within a glass tube, a coil adjacent said glass tube for applying a magnetic field to said contacts, a heating device for melting at least one end of said glass tube whereby one of said contacts can be embedded in viscous glass, means for moving said one contact in said viscous glass to position said one contact relative to the other of said contacts, and a switching unit controlling the current to said coil to create said magnetic field, said switching unit selectively supplying direct current or alternating current to said coil.

COAL

3,909,211

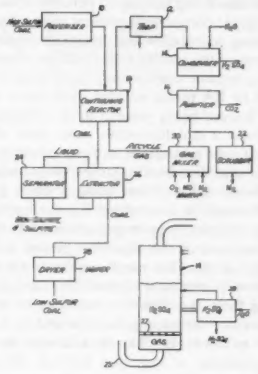
COAL DESULFURIZATION PROCESS

Arthur F. Diaz, University City, and Eugene D. Guth, Palos Verdes Peninsula, both of Calif., assignors to KVB Engineering, Inc., Tustin, Calif.

Filed Aug. 31, 1973, Ser. No. 393,301

Int. Cl. C10l *9/00*

U.S. Cl. 44—1 R **50 Claims**



1. A method for desulfurizing coal which includes the steps of:

a. heating coal particles to a temperature of from 100° to 500°F; and

b. subjecting said heated coal particles to an oxidizing gas having NO_2 as one of its constituents, said NO_2 selectively oxidizing sulfur-containing compounds in said coal particles, said other constituents of said oxidizing gas being substantially non-reactive with said coal, whereby oxidized sulfur-containing compounds and gaseous sulfur compounds are formed which are readily separable from said coal particles.

COAL

3,909,212

REMOVAL OF SULFUR FROM CARBONACEOUS FUELS

Wilburn C. Schroeder, 7316 Radcliffe Dr., College Park, Md. 20740

Filed June 29, 1973, Ser. No. 375,013

Int. Cl.[2] C10L *9/02, 9/08;* **C10B** *57/00*

U.S. Cl. 44—1 R **17 Claims**

1. A process for reducing the sulfur content of naturally-occurring, sulfur-containing, solid carbonaceous fuel to less than 1.0 percent, comprising reacting said fuel in particulate form under a pressure of at least 2 atmospheres with an oxygen-containing gas and with steam in a reaction zone, the amount of oxygen-containing gas being just sufficient to burn a portion of said fuel to raise the temperature of the fuel in said zone to about 1100° to 1500°F. and the steam being present in an amount sufficient to react with the fuel particles to generate nascent hydrogen at the surface and within said particles and form hydrogen sulfide with the sulfur therein, removing the sulfur containing gases from said zone and recovering the fuel of reduced sulfur content.

COAL

3,909,213
DESULFURIZATION OF COAL

Robert N. Sanders, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 17, 1973, Ser. No. 425,189
Int. Cl.[2] C10L *5/00*
U.S. Cl. 44—1 R **21 Claims**

1. A process for the desulfurization of coal which contains pyritic sulfur and sulfur-containing organic compounds comprising:

a. digesting, in a digestion zone, the coal and a Group IA or IIA metal oxide salt or mixtures thereof in the presence of a fused metal chloride salt medium, which medium is capable of dissolving at least 50 percent of the sulfur-containing organic compounds present in the coal and which has a melting point below the digestion temperature, until at least part of the pyritic sulfur and the dissolved sulfur-containing organic compounds have been converted to Group IA or IIA metal sulfides; said metal oxide salt or mixtures thereof being present in an amount which provides at least a stoichiometric mole ratio of said metal oxide salt to the amount of sulfur present in said pyritic sulfur and said dissolved organic compounds, said fused metal chloride salt medium being present in an amount which will result in a relatively liquid digestion mixture;

b. feeding anhydrous hydrogen chloride to the digestion zone subsequent to the digestion period to convert the formed Group IA or IIA metal sulfides to Group IA or IIA metal chlorides respectively and hydrogen sulfide; and

c. removing from the digestion zone an at least partially molten mixture containing desulfurized coal, the formed Group IA or IIA metal chloride salts and the metal chloride salt medium.

3,909,214
MULTIFUNCTIONAL GASOLINE ADDITIVE COMPOSITIONS

Perry Polss, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 27, 1973, Ser. No. 383,252
Int. Cl.[2] C10L *1/26*
U.S. Cl. 44—58 **10 Claims**

1. A gasoline-soluble, gasoline-additive composition consisting essentially of

i. a gasoline-soluble neutral salt of a C_4 to C_{10} aliphatic monoamine wherein each radical attached to the amine nitrogen is attached through a saturated carbon atom and a C_8 to C_{16} branched chain primary alkyl acid ester of orthophosphoric acid, and

ii. from about 1 to 50 parts by weight per part of said salt of liquid polypropyiene having a number average molecular weight in the range of about 600 to 1200.

3,909,215
RUST INHIBITORS FOR HYDROCARBON FUELS

Louis R. Kray, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 27, 1973, Ser. No. 345,402
Int. Cl.[2] C10L *1/14*
U.S. Cl. 44—62 **13 Claims**

7. A composition of matter comprising in an admixture (1) a major amount of an oleophilic organic liquid, (2) from 25 to 500 weight parts per million of a copolymer of an alpha-olefin having from 8 to 30 carbons and an N-substituted maleimide wherein the N-substituents are organic radicals having from 3 to 60 carbons and from 1 to 5 nitrogens, said copolymer having from 4 to 20 repeating olefin-maleimide units, and (3) from 10 to 500 weight parts per million of a hydrocarbyl amine, having from 3 to 60 carbons and from 1 to 10 nitrogens with a carbon to nitrogen atomic ratio from 5 to 30:1.

3,909,216
PREPARATION OF IMPROVED MOTOR FUELS CONTAINING FURAN ANTIKNOCKS

Richard S. Stearns, Malvern, Pa., and Robert M. Thompson, Wilmington, Del., assignors to Sun Ventures, Inc., Pa.

Filed July 14, 1972, Ser. No. 271,860
Int. Cl.[2] C01L *1/14*
U.S. Cl. 44—63 **14 Claims**

1. A process for improving the octane rating of a gasoline alkylate containing at least 6 percent by weight of a mixture of 2,4- and 2,5-dimethylhexanes which comprises the steps of:

a. separating at least about 4 percent of said dimethylhexanes from said alkylate;

b. oxidizing the dimethylhexanes with oxygen to form the corresponding 2,4- and 2,5-dimethylhexane dihydroperoxides;

c. reacting said hydroperoxides with a C_3–C_8 monoolefin to form a mixture of the corresponding dimethylhexane diols and olefin oxide, and recovering said olefin oxide from said mixture;

d. dehydrating said dimethylhexane diols to form 2,2,5,5-tetramethyltetrahydrofuran; and

e. combining said tetrahydrofuran with said gasoline alkylate from which the dimethylhexanes had been removed.

8. A process for the preparation of 2,2,5,5-tetramethyltetrahydrofuran which comprises the steps of:

a. oxidizing 2,4- and 2,5-dimethylhexane with oxygen to form 2,4- and 2,5-dimethylhexanedihydroperoxide;

b. reacting said hydroperoxides with a C_3–C_8 monoolefin to form a mixture of the corresponding dimethylhexane diols and olefin oxide, and recovering the olefin oxide from said mixture;

c. dehydrating said dimethylhexane diols to form 2,2,5,5-tetramethyltetrahydrofuran.

3,909,217
ABRASIVE COMPOSITION CONTAINING A GEL AND A BORON-DIALKYL SILICON-OXYGEN POLYMER

Kenneth E. Perry, Wellesley, Mass., assignor to Winfield Brooks Company, Inc., Woburn, Mass.

Continuation of Ser. No. 202,621, Nov. 26, 1971, abandoned.
This application Dec. 13, 1973, Ser. No. 424,588
Int. Cl.[2] C08J *5/14*; **C09K** *3/14*
U.S. Cl. 51—298 **9 Claims**

1. An abrasive composition comprising (1) a boron-dialkyl silicon-oxygen polymer, (2) a gel formed from a metallic soap of a fatty carboxylic acid having 8 to 22 carbon atoms and a hydrocarbon oil and (3) abrasive grit particles dispersed in said composition.

3,909,218
GAS SEPARATING APPARATUS

Shoji Kumura, Tokyo; Masayoshi Ohno, Yokohama, and Haruhiko Ohya, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Feb. 22, 1973, Ser. No. 334,837
Claims priority, application Japan, Feb. 29, 1972, 47-20978
Int. Cl. B01d *53/22*
U.S. Cl. 55—158 **4 Claims**

1. A gas separating apparatus comprising:

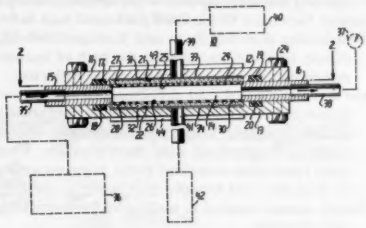
a casing having an inlet through which mixed gases are fed under relative pressure and a pair of outlets through which separated gases are exhausted, respectively;

a first membrane means mounted in said casing to permit one component of said mixed gases to permeate therethrough; and

a second membrane means mounted in said casing facing said first membrane means such that said mixed gases are fed between said first and second means, said second membrane means having a gas permeation property opposed to that of said first membrane means, and said second membrane means allowing the other component of mixed gases to permeate therethrough;

said casing being composed of a pair of cover plates overlapped upon each other each of which has a hollow or recessed portion for respectively mounting said membrane assemblies therein;

gas collection chambers being respectively defined within said recessed portions of said casing between said membrane assemblies and said cover plates and being fluidically connected with said pair of outlets, respectively, for



collecting said permeated and separated gases therein and for exhausting said gases therefrom;

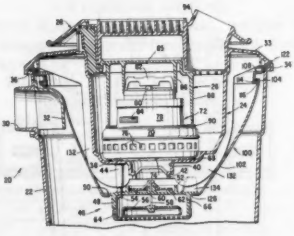
said membrane assemblies being composed of a flat type porous ceramic plate and a film like membrane mounted upon one surface of said ceramic plate, the rear surface of said ceramic plate having legs projecting therefrom against said hollow portion of said cover plate so as to define said gas collection chamber therebetween.

3,909,219

VACUUM CLEANER FILTER ASSEMBLY

Charles Thomas Fromknecht, Anderson, S.C., assignor to The Singer Company, New York, N.Y.

Filed Jan. 3, 1973, Ser. No. 320,801
Int. Cl.² B01D *46/44, 29/14*
U.S. Cl. 55—216 **7 Claims**



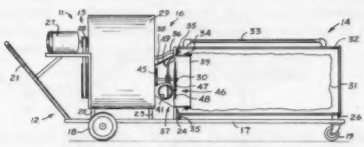
7. A filter assembly for a utility vacuum cleaner having an open top dirt receptacle, a power suction module including a housing having a peripheral edge mating with the top of the receptacle, and air shut-off means including a liquid level sensor supported by the housing and depending into the receptacle, said assembly comprising a substantially cup-like fabric filter having a resilient rubber striping on the upper peripheral edge, said resilient edge being disposed about a rigid molded synthetic plastic hoop having a peripheral shelf for positionally seating said resilient edge, a peripheral lip formed on said hoop above said shelf, an annular seal including a peripheral groove within which said lip is received, said seal being adapted to be interposed between said housing peripheral edge and the top of said receptacle, and means defining a sensor receiving aperture in the bottom of said fabric filter, the border of said aperture including stitching means adapted to provide a seal with an annular portion of said shut-off means.

3,909,220

FLAIL DEVICE AND LAWN CLEANING AND PACKING APPARATUS

Laurie L. Ylinen, 2211 26th St., Rock Island, Ill. 61201

Filed June 3, 1974, Ser. No. 475,812
Int. Cl.² B04C *5/04*
U.S. Cl. 55—296 **1 Claim**



1. A vacuum cleaning and mechanical packing device comprising: a housing including a frustum-shaped portion with a first opening in the smaller end of said portion and a second opening in the larger end thereof, a fan connected to said housing outside said frustum-shaped portion communicating with said first opening to draw a stream of air therefrom, an intake duct for passage of air and debris having an outlet directed inwardly substantially tangentially and circumferentially to the tapered inner surface of said frustum-shaped portion near said first opening such that a stream of air and debris carried therein as a result of operation of said fan are drawn inwardly through said duct to form a circular stream within said frustum-shaped portion, the debris in said circular stream tending to move peripherally to be adjacent the conicl surface of said frustum-shaped portion, a shaft rotatably mounted on the longitudinal axis of said housing, power means connected to said shaft to cause rotation thereof, a plurality of elongated flails, each having on one end thereof pivotal mounting means connected to said shaft at a point diametric to the conical surface within said frustum-shaped housing that is adjacent said second opening, said pivotal means being distributed about said point of said shaft so that said flails extend on substantially equally spaced radii as they are extended outwardly from the shaft by centrifugal force during rotation of the shaft, the ends opposite said pivotal means turned at an angle to form respective paddle-like portions and the flails being of such length to permit said paddle-like portions to revolve adjacent said conical surface, said paddle-like ends also turned in a slanting direction toward said second opening along said conical surface such that said paddle-like ends slant rewardly relative to their direction of movement, a circular baffle disposed coaxially within said frustum-shaped portion between said second opening and said point of said shaft to which said flails are attached, the baffle having substantially shorter diameter than the diameter of the adjacent surface of said frustum-shaped portion to allow debris that is stuck by said flails to pass by the edge of said baffle, and a receptacle connected to said housing and communicating with said second opening to receive debris forced around said baffle by operation of said flails, the improvement comprising:

each of said flails having a formation with a double curvature; a first curvature seen by viewing a said flail in plan by looking down from a cross-section taken through the shaft for said flail, wherein said flail curves in a first portion away from said shaft toward the straight inner edge of the larger second opening of said frustum-shaped portion, and then wherein the flail terminates in a second trailing portion of a substantially planar nature disposed parallel the said straight inner edge; and

said second curvature seen by viewing a said flail in side elevation, said flail having upper and lower identically curved edges extended from said shaft, the lower edge of which is disposed contiguous and complimentary to the inner surface of said frustum-shaped portion.

3,909,221
FILTERING DEVICE

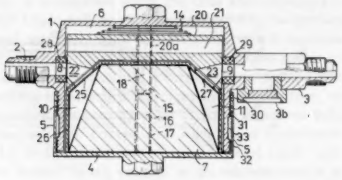
Goran Vilhelm Bengtsson, Antenngatan 7, S-421 33 Vastra Frolunda, Sweden

Filed Feb. 25, 1974, Ser. No. 445,520

Claims priority, application Sweden, Feb. 28, 1973, 7302812

Int. Cl.² B01D *46/44*

U.S. Cl. 55—314 **1 Claim**



1. A filter device comprising:
a filter element;
a hollow cylindrical housing having inlet and outlet openings and a channel between the openings receiving said filter element;
a piston displaceable in said housing, said piston including two passages extending inwardly from its peripheral surface for establishing communication between the inlet and outlet openings through the filter element channel;
a cap for sealing the channel of the housing and for permitting removal and replacement of the filter element; and spring means disposed in said housing and urging said piston in a direction towards the filter element;
so that when the filter element is removed by removing said cap from the channel of said housing, said spring will displace said piston to prevent the inlet and outlet openings from being in flow communication with the channel; said piston being provided with a cross bore situated at an axial distance from said inlet and outlet openings when the filter is in said channel, said cross bore establishing direct communication between the inlet and the outlet upon removal of the filter element.

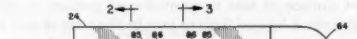
3,909,222
WASTE COLLECTION APPARATUS

James Daniel Caughlin, 6643 Muirlands Dr., La Jolla, Calif. 92037, and John D. Bell, 2738 Point Dr., Monroe, La. 71201

Filed Dec. 12, 1973, Ser. No. 424,180

Int. Cl.² B01D *50/00*

U.S. Cl. 55—317 **1 Claim**



1. Waste collection apparatus, comprising:
an elongated separation chamber having an upper portion with an inlet at one end for connection to a source of waste material;
the other end of said upper portion having an air outlet;
said chamber having a lower portion with downwardly converging side walls;
a trough extending longitudinally along and connected to the lower end of said side walls;
a compacting conveyor mounted in said trough and having an outlet opening at one end;
an inverted V-shaped deflector fixed in the upper portion of said chamber with the apex thereof extending longitudinally for the full length of the chamber, with said inlet opening immediately below the apex of the deflector;
scatter bars fixed to the apex portion of said deflector and extending downwardly in said V-shaped deflector immediately adjacent said inlet in the path of incoming waste material in the upper portion of the deflector;
the lower edges of said deflector extending a substantial distance below said inlet opening and being closely spaced from the lower portion of said side walls and defining longitudinal slots therebetween, whereby the large particulate contained in the waste material is caused to drop into said trough;
blower means coupled to said outlet for extracting air from said chamber;
condenser means between said air outlet and said blower for separating fine particulate matter from air extracted from the chamber;
and said upper portion has a manifold extending substantially the full length of the chamber above said deflector and leading to said air outlet.

3,909,223
DUST EXTRACTION EQUIPMENT FOR BULK MATERIAL HANDLING INSTALI ATIONS

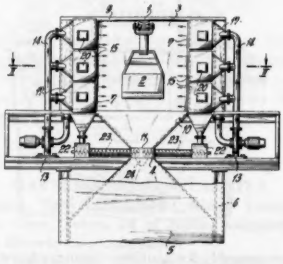
Reinhold Schmidt, Holtwick, Haltern, Germany, assignor to GFE Gesellschaft fur Entstaubungstechnik AG, Sursee, Switzerland

Filed May 13, 1974, Ser. No. 469,371

Claims priority, application Switzerland, May 15, 1973, 6870/73; Germany, Mar. 12, 1974, 2411653

Int. Cl.² B01D *46/02*

U.S. Cl. 55—467 **6 Claims**



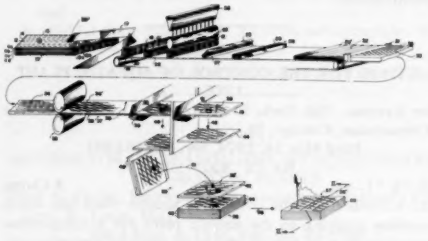
1. Apparatus for the extraction of dust from bulk handling installations in which the load is discharged into a bunker, comprising
means providing an unloading compartment adapted to be disposed above the inlet to the bunker, said compartment being closed except for an inlet aperture into which the load is delivered and an outlet opening to the bunker, two series of air filters oppositely arranged within said compartment between which the load passes to said outlet opening,
a conduit common to each series of filters for drawing air from said compartment through the respective filters,
nozzle means connected to the outer end of each conduit constructed and arranged to direct streams of air to said inlet aperture for creating an air shield at the aperture to prevent egress of dust, and

suction pumps for and connected to each of said conduits respectively for drawing air through said filters and forcing same to said nozzle means.

3,909,224
FILTER

Victor Vernon Spencer, P.O. Box 368, Tillsonburg, Ontario, Canada

Filed Jan. 4, 1974, Ser. No. 430,739
Claims priority, application Canada, Feb. 5, 1973, 162925
Int. Cl.² B01D *46/00*
U.S. Cl. 55—482 **4 Claims**

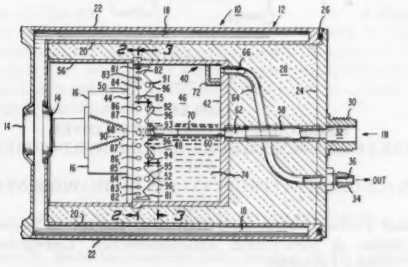


1. A filter media having a plurality of stacked, crushed honeycomb layers of nonaligned uniform cells, said media including means holding the layers in relative juxtaposition wherein each layer is composed of a plurality of overlapping, generally open cells, each cell with circumscribing walls of substantial depth defining a cell axis, said walls generally flattened and lying in the relative plane of the layer, and at least one of the walls disposed in overlapping relationship to one of adjacent cells of the layer, the axis of the crushed cells being disposed at oblique angles relative to the media of the plane of the layer.

3,909,225
CRYOGENIC DEWAR

Robert Edward Rooney, Danvers, Mass., assignor to Robert Edward Rooney, Danvers, Mass. and RCA Corporation, New York, N.Y.

Filed May 3, 1974, Ser. No. 466,725
Int. Cl.² F25B *19/00*
U.S. Cl. 62—514 **12 Claims**



1. A cryogenic cooling apparatus using liquid cryogen as a cooling medium comprising:

a cooling chamber thermally isolated from the ambient,

a thermally conductive heat transfer member including cooling means disposed within said chamber, said cooling means having a plurality of conduits, each conduit communicating within said member with the remaining conduits at one end of said conduits, the other end of each said conduit being in respective, separate communication with said chamber, said member having a surface thereof outside said chamber thermally conductive with said cooling means for cooling an object thermally connected to said surface,

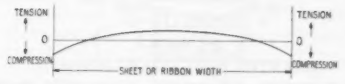
liquid cryogen inlet means connected to said conduit one ends for dispensing said liquid cryogen under pressure to said communicating one ends and for forcing said cryogen to flow through said conduits to said other end of said conduits, and

cryogen gas exhaust means connected to said chamber for removing evaporated cryogen from said chamber to thereby provide continuous cooling by said liquid cryogen within said conduits.

3,909,226
CUTTING GLASS

Ian Alexander McCourty, Wigan; Howard Wood McKenzie, Southport, and Philip James Oakland, Liverpool, all of England, assignors to Pilkington Brothers Limited, St. Helens, England

Filed Sept. 19, 1973, Ser. No. 398,904
Claims priority, application United Kingdom, Sept. 20, 1972, 43621/72
Int. Cl.² C03B *21/02*
U.S. Cl. 65—97 **16 Claims**



1. A method of cutting a straight, elongated strip from flat, unbent, glass in ribbon or sheet form, which method comprises modifying the stress pattern in the strip region by treating the glass to form in the glass a line of tensile stress along the strip between a substantially straight cutting line and the edge line of the ribbon or sheet which is under compressive stress, and the further step after modifying the stress pattern of causing the glass to fracture along the cutting line while the modified stress pattern still exists by scoring along the cutting line and applying a bending moment across the score line.

12. Apparatus for cutting an elongated strip from flat glass in ribbon or sheet form comprising conveyor means for the flat glass, thermal means for modifying the stress pattern in the strip region to form a line of tensile stress along the strip between a cutting line and the edge of the ribbon or sheet, scoring means for scoring the glass along the cutting line, and fracturing means located downstream of said thermal means as considered in the direction of glass travel for fracturing the glass along the cutting line while the modified stress pattern still exists.

3,909,227
METHOD AND APPARATUS FOR MODIFYING FLOW IN THE REFINING ZONE OF A GLASS MELTING TANK

George Alfred Dickinson, St. Helens, England, assignor to Pilkington Brothers Limited, Lancashire, England

Filed Jan. 15, 1974, Ser. No. 433,576
Int. Cl. C03b *5/22*
U.S. Cl. 65—134 **24 Claims**

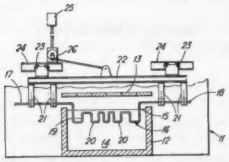
1. In a method of producing glass wherein constituent material is melted in a melting region of glass melting tank and the molten glass is refined in a refining region through which it passes into a working region from which glass is withdrawn from the tank, the improvement for enhancing the homogeneity of the glass through modifying the flow of molten glass in the refining region and from the refining region into the working region comprising:

retarding the flow of the upper region of the molten glass towards the working region by disposing at least one pipe

generally horizontally across at least part of the tank in a posture extending across the centre of the molten glass flow path through the upper region of the molten glass, at or near the junction of the refining region with the working region;

modifying the temperature of the upper region of the molten glass by circulating cooling fluid through said at least one pipe; and transversely displacing molten glass in the forward flow of glass adjacent said at least one pipe by moving said at least one pipe transversely across the tank so as to tend to induce stretching of the glass prior to entry into the working region.

5. In a glass producing apparatus including a tank for containing molten glass and having a feeding end at which material is fed into the tank, a working region from which molten glass is taken from the tank, and a refining region through which glass flows between the feeding end and the working region, the improvement for enhancing the homogeneity of



the glass through modifying the flow of molten glass in the refining region and from the refining region into the working region comprising:

hollow fluid cooled pipe means disposed, at or near the junction of said refining region with said working region, generally horizontally across at least part of the tank in a posture extending across the centre of the molten glass flow path at a height above the tank bottom such as to be submerged in the upper region of molten glass, said pipe means being operable to

retard the flow of the upper region of the molten glass toward the working region, cool the temperature of the upper region of the molten glass, and reciprocating means for effecting movement of said pipe means transversely across the tank to effect transverse displacement of molten glass in the forward flow of glass adjacent thereto so as to induce stretching of the glass horizontally prior to entry into the working region.

3,909,228

COMPOSITION FOR CONDITIONING SOIL

Todomu Nakashima, and Naoki Takahashi, both of Kumamoto, Japan, assignors to Eisai Co., Ltd. and Kabushiki Kaisha Seikaken, both of Tokyo, Japan

Continuation of Ser. No. 158,557, June 30, 1971, abandoned. This application Mar. 14, 1974, Ser. No. 451,379

Claims priority, application Japan, Apr. 3, 1970, 45-57724; June 22, 1971, 46-44532

Int. Cl.² C05B *15/00*

U.S. Cl. 71—1 **5 Claims**

1. A soil conditioning composition consisting essentially of a condensed phosphate containing 73–87 percent P_2O_5 by weight and a polyacrylamide or partially hydrolyzed product thereof, wherein the condensed phsophate is employed in a range 1–3 times the weight of the polyacrylamide or partially hydrolyzed product thereof.

3,909,229

PLANT NUTRIENTS

Louis E. Ott, St. John, Ind., assignor to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 404,367, Oct. 5, 1973, abandoned, which is a continuation of Ser. No. 198,963, Nov. 15, 1971, abandoned. This application Sept. 30, 1974, Ser. No. 510,169

Int. Cl.² C05D *9/02*

U.S. Cl. 71—64 C **10 Claims**

1. A liquid zinc micronutrient composition of an aqueous ammoniacal ionic solution of a zinc carboxylate containing one to five carbon atoms wherein said solution consists of from about 5 to about 20 weight percent zinc, at least about four mols of ammonia per mol of zinc, and at least 10 weight percent water.

3,909,230

METHOD FOR THE CONTROL OF AQUATIC PLANT LIFE

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed May 14, 1974, Ser. No. 462,001

Int. Cl.² A01N *9/00*

U.S. Cl. 71—66 **5 Claims**

1. A method for the control of aquatic plant life which comprises applying to the aquatic plant life a composition comprising an inert carrier, and as an essential active ingredient, in a quantity toxic to aquatic plant life, the compound 2-(3,4-dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione.

3,909,231

CYANO SUBSTITUTED MALANILATE BIOCIDES

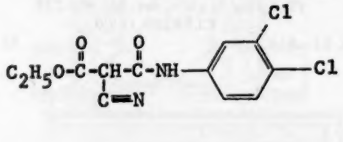
George B. Large, Pinole, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 339,791, March 9, 1973, Pat. No. 3,860,627. This application Sept. 5, 1974, Ser. No. 503,552

Int. Cl.² A01N *9/00, 11/00, 23/00, 9/06*

U.S. Cl. 71—67 **1 Claim**

1. The method of controlling parasites selected from the group consisting of fungi, bacteria and algae comprising applying to the pests or habitat thereof a fungicidally, bactericidally or algicidally effective amount of a compound having the following formula:



3,909,232

HERBICIDE MIXTURES OF 3-LOWER ALKYL-2,1,3-BENZOTHIADIAZINONE-(4)-2,2-DIOXIDE AND N-(1,1-DIMETHYLPROPYNYL)-3,5-DICHLOROBENZAMIDE

Adolf Fischer, Mutterstadt, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 343,629, March 22, 1973. This application Jan. 11, 1974, Ser. No. 432,675

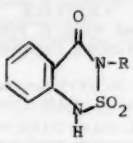
Claims priority, application Germany, Apr. 13, 1972, 2217722

Int. Cl.² A01N *9/12, 9/20*

U.S. Cl. 71—91 **2 Claims**

1. A herbicide composition comprising an inert solid or liquid carrier having dispersed therein a herbicidally effective amount of herbicides consisting essentially of

a. a compound of the formula



wherein R denotes alkyl of a maximum of four carbon atoms, or an alkali metal, ammonium, lower alkylammonium, lower hydroxyalkylammonium or lower alkyl lower hydroxyalkylammonium salt of said compound, and

b. N-(1,1-dimethylpropnyl)-3,5-dichlorobenzamide in a weight ratio of *a* to *b* in the range of 3:1 to 1:3.

3,909,233

METHOD FOR INCREASING THE SUCROSE CONTENT OF GROWING PLANTS

Clark A. Porter, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 4, 1974, Ser. No. 447,706
Int. Cl.[2] A01N 9/36
U.S. Cl. 71—86 **9 Claims**

1. A method for increasing the sucrose content of sugar cane plants which comprises applying to said plants, from about 2 to 8 weeks prior to harvest, an effective amount of a compound of the formula

$$R - N - (CH_2PO_3H_2)_2$$

wherein R represents methyl, ethyl, chloromethyl or chloroethyl, or an alkali metal, ammonium or lower alkylamine salt thereof.

3,909,234

SYNERGISTIC HERBICIDAL COMPOSITION FOR THE CONTROL OF WEEDS

Wilfried Faust, Cologne, and Kurt Westphal, Wuppertal-Vohwinkel, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 15, 1969, Ser. No. 885,367
Claims priority, application Germany, Dec. 17, 1969, 1815145
Int. Cl. A01n 9/22
U.S. Cl. 71—93 **8 Claims**

1. Synergistic herbicidal composition comprising an effective amount of 3-methylmercapto-4-amino-6-isopropyl-1,2,4-triazin-5-one with N'-(3,4-dichloro-phenyl)-N,N-dimethylurea and 3-amino-1,2,4-triazole in admixture in a ratio by weight of substantially about 2:1:1.

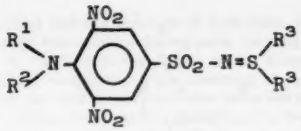
3,909,235

SUBSTITUTED SULFANILYL SULFILIMINE COMPOUNDS AS HERBICIDES

James R. Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 183,644, Sept. 24, 1971, Pat. No. 3,786,048. This application July 13, 1973, Ser. No. 379,035
Int. Cl.[2] A01N 9/12
U.S. Cl. 71—90 **11 Claims**

1. The method suitable for effecting plant growth inhibition which comprises applying to a plant part a growth-inhibiting amount of an active agent, said active agent being a compound of the formula



wherein R^1 represents hydrogen or R^2, and each R^2 independently represents loweralkyl of C_1–C_4, loweralkenyl of C_3–C_4, loweralkynyl of C_3–C_4, or radical of the formula $-CH_2-CH_2-(CH_2)_n-Y$ wherein *n* represents 0 or 1, and Y represents methoxy, cyano, bromo, or chloro, subject to the limitation that the groups represented by R^1 and R^2 together contain from 2 to 8, both inclusive, carbon atoms; and each R^3 is taken separately and independently represent loweralkyl of C_1–C_3 or phenyl subject to the limitation that both R^3 groups, together, do not contain more than 8 carbon atoms, or both R^3 groups are taken together, and represent a divalent radical selected from the group consisting of $-(CH_2)_2-O-(CH_2)_2-$ and $-(CH_2)_q-$ wherein *q* represents 4, 5, or 6.

3,909,236

LIQUID URACIL CONCENTRATES

Archibald Miller Hyson, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 244,874, April 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 614,817, Feb. 9, 1967, abandoned. This application Oct. 11, 1973, Ser. No. 405,546
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—92 **12 Claims**

1. A liquid, water-soluble, herbicidal concentrate consisting essentially of

a. about 20–40 weight percent of one or more lithium salts of any of the following uracils:
3-tert-butyl-5-chloro-6-methyluracil,
3-sec-butyl-5-chloro-6-methyluracil, and
3-sec-butyl-5-bromo-6-methyluracil; and

b. 60–80 weight percent of a glycol medium, wherein 30–80 weight percent is ethylene glycol, 0–20 weight percent is methanol, ethanol, or methanol-ethanol mixture, with the proviso that not more than 10% of the glycol medium be methanol, and 20–50 weight percent is water.

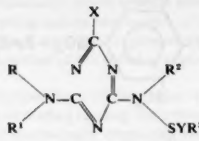
3,909,237

HERBICIDAL N-SUBSTITUTED-DITHIOAMINO AND N-SUBSTITUTED-OXYTHIOAMINO TRIAZINES

James D. Cleveland, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 430,321, Jan. 2, 1974, Pat. No. 3,864,342, which is a continuation-in-part of Ser. No. 251,088, May 8, 1972, Pat. No. 3,796,712. This application Oct. 29, 1974, Ser. No. 518,315
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—93 **22 Claims**

1. A method for the control of undesirable vegetation which comprises applying thereto a herbicidally effective amount of a triazine compound of the formula



wherein X is fluorine, chlorine, bromine, alkoxy of 1 to 4 carbon atoms, or alkylthio of 1 to 4 carbon atoms, R is hydrogen or alkyl of 1 to 4 carbon atoms, R^1 is alkyl of 1 to 4 carbon atoms, R^2 is alkyl of 1 to 4 carbon atoms, R^3 is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or carbocyclic mononuclear or binuclear aryl of 6 to 12 carbon atoms and of up to 2 fluorine, chlorine, bromine, trifluoromethyl, nitro or alkoxy of 1 to 4 carbon atoms, and Y is oxygen or sulfur.

3,909,238

RIPENING OF SUGARCANE BY USE OF POLYETHYLENE OXIDE ADDUCTS OF FATTY ACID ESTERS OF SORBITOL

Louis G. Nickell, Honolulu, Hawaii, assignor to Hawaiian Sugar Planters' Association, Honolulu, Hawaii

Continuation-in-part of Ser. No. 275,890, July 27, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 461,107

Int. Cl.² A01N *9/24*

U.S. Cl. 71—106 **9 Claims**

1. A process for increasing the sugar yield of grown sugarcane which comprises applying to the cane at a time at least about 2 weeks and up to about 10 weeks prior to harvest an amount effective to increase the sugar yield of a composition containing as essentially the sole active ingredient a polyethylene oxide adduct of a fatty acid ester of sorbitol.

3,909,239

METHOD OF CONTROLLING BULK DENSITY OF FERROUS POWDER

Gerhard Findeisen, Rheydt; Norbert Dautzenberg, Meerbusch, and Hartmut Gesell, Duisburg, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed June 27, 1973, Ser. No. 374,100

Claims priority, application Germany, June 29, 1972, 2232760

Int. Cl.² B22F *9/00*

U.S. Cl. 75—.5 BA **5 Claims**

1. In a method for atomizing molten iron or steel by means of pressurized water atomizing a pouring stream of the liquidous iron or steel to obtain a ferrous powder which is subsequently annealed for reducing the oxygen and carbon content and which is to be used for press-forming of parts by pressing such powder into a mold, the improvement comprising, adding pure oxygen or oxygen enriched air at an oxygen pressure from 2 to 6 atmospheres to the water to enrich the relative oxygen content in the water, so that the partial pressure of the oxygen is larger than normal; and using the oxygen-enriched water for the atomization so as to increase the oxidation layer on the powder particles as produced by the atomization beyond the layer thickness as resulting from mere use of water as atomizing agent, so that the surface of the individual powder particles are spongy as resulting from removal of the oxygen during subsequent annealing to obtain a reduction in the bulk density of the powder.

3,909,240

METHOD OF PRODUCING ACICULAR METAL CRYSTALS

Robert J. Deffeyes, and Wesley R. Tyler, both of Arlington, Tex., assignors to Graham Magnetics Incorporated, Graham, Tex.

Filed Sept. 28, 1973, Ser. No. 401,636

Int. Cl.² C22B *23/04*

U.S. Cl. 75—.5 AA **30 Claims**

1. In a process for making metal powders comprising the steps of reacting metal ions with an organic acid from a liquid medium, precipitating an organometallic salt, and reducing the salt to a powder, the improvement comprising the steps of

a. initiating the precipitation by forming seed crystals of said organic acid and cations of a seed metal, said forming taking place in the presence of a quantity of a complexing agent for said seed metal, said complexing agent forming means to facilitate a preferential crystal growth of said acicular organometallic salt crystals along the long axis thereof,

b. utilizing said seed crystals as growth initiating sites for formation of said acicular organometallic salts or as intermediate seed crystals subsequently used to form said organometallic salts

c. and reducing said organometallic salts to a metal powder.

3,909,241

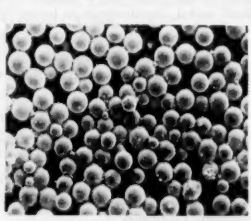
PROCESS FOR PRODUCING FREE FLOWING POWDER AND PRODUCT

Richard F. Cheney; Frederick J. Mower, both of Towanda, and Charles L. Moscatello, Sayre, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 17, 1973, Ser. No. 425,226

Int. Cl.² B22F *9/00*

U.S. Cl. 75—.5 BB **2 Claims**



1. A free flowing flame spray powder consisting essentially of substantially spherical particles of an inorganic material having a melting point above 1800°C, the powder having an apparent density of at least 40% of the theoretical density of the material and a particle size distribution within the range of about 60 micrometers, the powder characterized by particles having substantially smooth nonporous surfaces and by a Hall flow within the range of from about 9 to 21 seconds.

3,909,242

METHOD FOR DETERMINING OPERATING CONDITIONS IN ELECTRICAL FURNACES

Nils Skreien, Skedsmokorset, Norway, assignor to Elkem Spigerverket A/S, Oslo, Norway

Filed Oct. 4, 1973, Ser. No. 403,638

Claims priority, application Norway, Oct. 9, 1972, 3606/72

Int. Cl.² C22B *4/00*; **H05B** *7/18*

U.S. Cl. 75—10 **6 Claims**

1. A method for determining the metallurgical conditions in an electrical furnace having at least one electrode, said method comprising the steps of:

measuring an electrical parameter which is non-linearly varied by conditions within the electrical furnaces caused by the metallurgical processes being effected;

processing at least one harmonic of the measured electrical parameter to derive a signal for use in controlling the metallurgical processes; and

controlling the metallurgical processes in response to the derived signal.

3,909,243

RECOVERY OF BOTH BRASS AND ZINC FROM METALLURGICAL RESIDUES BY CARBON FLOTATION METHOD

William M. McKewan, Monroeville, Pa., assignor to Roessing Bronze Company, Mars, Pa.

Continuation of Ser. No. 328,590, Feb. 1, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,529

Int. Cl.[2] C21B *3/04*

U.S. Cl. 75—24 **6 Claims**

1. A continuous method of recovering both metallic brass and metallic zinc from residues containing brass in the amount of from at least 1.5% of the contents of said residue and zinc oxide in amounts of at least 20% of the balance of said residue, said residue being comprised of slags or melting furnace skimmings and admixtures thereof, comprising the steps of periodically charging the residue into a furnace; melting and heating said residue up to a temperature of about 1250° C., said molten brass sinking to the bottom of the furnace; periodically adding carbon to the surface of the molten bath in free floating form in an amount sufficient to reduce the zinc oxide content of said balance of said slag to zinc in vapor form; continually withdrawing and condensing said zinc in vapor form to metallic zinc; periodically tapping the molten brass from said furance and periodically removing the zinc exhausted slag from said furnace at a final zinc oxide content approaching 0.15%, the rate of addition of said charging residue and said carbon and the rate of withdrawing of said vaporized zinc, said brass and said spent slag being such as to maintain a metal pool, a slag layer and free floating carbon at all times in said furnace at temperature of about 1250° C.

3,909,244

PROCESS FOR DIRECTLY REDUCING IRON ORES IN THE SOLID STATE UNDER PRESSURE

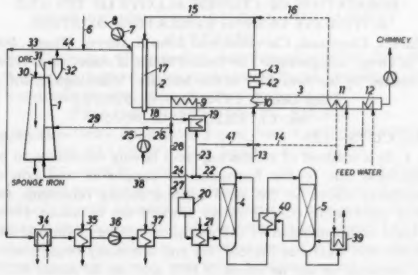
Fritz Rose, Ober-Erlenbach; Horst Bechthold, Frankfurt am Main; Paul Bieniok, Bischofsheim, and Dieter Stein, Wiesbaden, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 219,091, Jan. 19, 1972, abandoned. This application June 11, 1974, Ser. No. 478,430

Claims priority, application Germany, Jan. 27, 1971, 2103731

Int. Cl.[2] C21B *13/02*

U.S. Cl. 75—35 **9 Claims**



1. Process for directly reducing lumpy or agglomerated materials consisting of iron oxide which consists of treating said materials with a hydrogen-containing reducing gas in a shaft furnace having an upper zone for receiving said materials to be reduced, a reducing zone below said upper zone on a medium level under a pressure of 3–30 atms. and a lower cooling zone below said reducing zone, carrying out the reducing in said reducing zone at a temperature of 600°–1000°C, said reducing gas consisting of hydrogen and impurities, the total of said impurities being less than 12 percent by volume, said impurities consisting of a maximum of 5 percent by volume carbon monoxide, a maximum of 5 percent by volume of carbon dioxide, a maximum of 5 percent by volume methane and a maximum of 2 percent by volume steam, said reducing gas being supplied hot to said reducing zone thereby solely supplying the necessary heat for the reduction process, and cold to the lower portion of the furnace as a cooling gas for the reduced iron.

3,909,245

PROCESS FOR LOWERING THE IRON CONTENT IN NICKEL MELTS

Karl Brotzmann, and Hans Georg Fassbinder, both of Sulzbach-Rosenberg, Germany, assignors to Eisenwerk-Gesellschaft Maximilianshutte mbH, Sulzbach-Rosenburg, Germany

Filed Mar. 29, 1974, Ser. No. 456,412

Claims priority, application Germany, Mar. 30, 1973, 2316110

Int. Cl.[2] C21C *5/34*

U.S. Cl. 75—60 **7 Claims**

1. In a process for diminishing the content of iron and other contaminants in iron-nickel melts containing more than 20% of nickel, in which an oxygen-containing refining gas is blown into a convertor, to oxidize the iron and other contaminants in said melt, thereby enriching the nickel content of the melt, the improvement which comprises:

blowing into said convertor a mixture of oxygen and cooling medium and a separate stream of hydrocarbon surrounding said mixture, said mixture and said hydrocarbon being blown into the convertor beneath the bath surface,

wherein said cooling agent is a decomposable substance selected from the group consisting of limestone, water vapor and carbon dioxide and mixtures thereof.

3,909,246

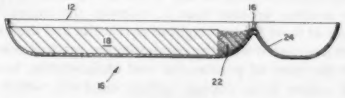
PROCESS FOR REMOVING IMPURITIES FROM ZONE REFINED MATERIALS

Roger A. Cole, Goleta, and Nathan L. Skinner, Lompoc, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 20, 1972, Ser. No. 317,505

Int. Cl.[2] C22B *9/02*

U.S. Cl. 75—65 ZM **3 Claims**



1. A zone refining process for removing impurities from an elongated ingot having a segregation coefficient less than one, which process includes the steps of:

a. placing said ingot in a zone refining boat;

b. creating a molten zone in a selected region of said ingot;

c. moving said molten zone along the length of said ingot one or more times during which time the actual molten material in said ingot is continuously changing, as solid material at the leading edge of the moving zone is melting, and the molten material at the trailing edge of the moving zone is re-solidifying, and, during which time impurities build up at one end of said ingot; and

d. passing a portion of said molten zone over a spillway at one end of the zone refining boat to thereby isolate some of the impurities from said ingot and result in an ingot having a high purity level and eliminate the necessity for

removing said ingot from the boat and cropping off the end of said ingot before said zone refining process is completed.

3,909,247

PRODUCTION OF METALS AND METAL ALLOYS OF HIGH PURITY

René Antoine Pâris, 152, Cours Gambetta, Lyon 7°, Rhome; Paul Alexis Amblard, 3, rue Julien Baudran, Bron, Rhone, and Abel Claude Rousset, 37 bis, rue Jean Moulin, Caluire, Rhone, all of France

Filed May 3, 1972, Ser. No. 250,080

Claims priority, application France, May 6, 1971, 71.17059; Nov. 3, 1971, 71.40191

Int. Cl. C22b *61/04*; **C01c** *3/08, 3/10*

U.S. Cl. 75—84.1 R **11 Claims**

1. A process for producing a metal or a metal alloy consisting essentially of the steps of forming a cyanide complex of at least one metal selected from the group which consists of beryllium, magnesium, aluminum, yttrium, lanthanide elements of atomic numbers 58 to 71 inclusive, zirconium, hafnium, chromium, gallium, indium, cobalt and nickel, said cyanide complex being formed by crystallizing it from an aqueous solution of ions of its components, and drying the crystals thus formed under vacuum or in a stream of hydrogen at a temperature of 150° to 250°C; and reducing said cyanide complex with dry gaseous hydrogen at a temperature 700° to 1300°C.

3,909,248

SEPARATION OF NICKEL FROM COPPER

Peter John Ryan, Mississauga; Gerald Vernon Glaum, Oakville, and Einar Walli, Burlington, all of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed May 4, 1973, Ser. No. 357,347

Claims priority, application Canada, May 8, 1972, 141596

Int. Cl.² C22B *3/00, 23/04*

U.S. Cl. 75—101 R **14 Claims**

1. A process for treating beneficiated ores and/or ore concentrates containing nickelferous sulfide minerals and cupriferous sulfide minerals both of which are associated with iron sulfides corresponding to the formula Fe_xS_{x+1} wherein x is a whole number greater than 1, wherein the mineral treated contains at least 5% by weight of pyrrhotite and the nickel and copper associated with the pyrrhotite are predominantly present in the form of pentlandite and chalcopyrite, to separate nickel values from copper sulfide minerals, which process comprises: establishing in an autoclave an aqueous slurry of said ores and/or ore concentrates; establishing a free-oxygen-containing atmosphere having an oxygen partial pressure of at least about 3 atmospheres over the slurry; maintaining the slurry at a temperature between about 80° and 110°C.; vigorously agitating the slurry to maintain a uniform dispersion of solids therein, to maximize oxygen transfer into the aqueous slurry from the atmosphere, to selectively convert iron sulfides to elemental sulfur and iron hydroxide and the nickeliferous sulfide minerals to nickel sulfate which are dissolved in the aqueous slurry to provide a nickel sulfate solution by oxidation reactions; terminating the oxidation reactions after a preponderant part of the iron sulfides and the nickeliferous sulfide minerals have been oxidized, the cupriferous sulfide minerals remaining substantially unoxidized; recovering nickel from the nickel sulfate solution; and recovering the unoxidized cupriferous sulfide minerals to provide a high grade cupriferous sulfide mineral concentrate.

3,909,249

PROCESS OF SELECTIVELY RECOVERING NICKEL AND COBALT

Peter Wallace Coldrey, North Balwyn, and John Barrington Glen, Armadele, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Nov. 1, 1974, Ser. No. 520,641

Claims priority, application Australia, Nov. 14, 1973, 5646/73

Int. Cl.² C22B *23/00*

U.S. Cl. 75—119 **6 Claims**

1. A process for extracting cobalt and nickel from oxidized nickel ores containing between 0.5–5% nickel, 5–30% iron, 1.0–25% w/w magnesium and minor amounts of cobalt, which process comprises firstly, selectively treating the ore with a reducing agent under reducing conditions so that substantially all the nickel and cobalt values are reduced to metal but substantially all the iron and magnesium remain as oxide secondly, treating the reduced ore with a mixture of hydrogen chloride and steam at a temperature in the range from 150° to 500°C and at a volume ratio of steam to hydrogen chloride in the range from 1:2 to 15:1 whereby the nickel and cobalt values contained in the ore are converted to water soluble chlorides and the iron and magnesium values remain in a water insoluble oxidized form and, thirdly, leaching the nickel and cobalt values from the reduced ore with an aqueous leaching solution.

3,909,250

OXIDATION-RESISTANT FERROUS ALLOY

Joseph C. Jasper, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Division of Ser. No. 373,278, June 25, 1973. This application May 15, 1974, Ser. No. 470,175

Int. Cl.² C22C *38/06, 38/26, 38/28*

U.S. Cl. 75—124 **3 Claims**

1. An alloy having good oxidation resistance at elevated temperature, good weldability and good formability, consisting essentially of, by weight percent, from about 0.04 to about 0.06% carbon, from about 1.7 to about 2.1% chromium, from about 1.7 to about 2.0% aluminum, from about 0.6 to about 0.9% silicon, from about 0.2 to about 0.4% manganese, from about 0.1 to about 0.6% titanium, with the titanium content being at least about 8 times the carbon content, and remainder iron except for incidental impurities.

3,909,251

PREVENTION OF SURFACE CRACKING DUE TO FORMATION OF COPPER ALLOYS OF TIN AND ANTIMONY DURING REHEATING OF STEEL

Mark I. Copeland, Corvallis, and John S. Howe, Albany, both of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 5, 1974, Ser. No. 529,783

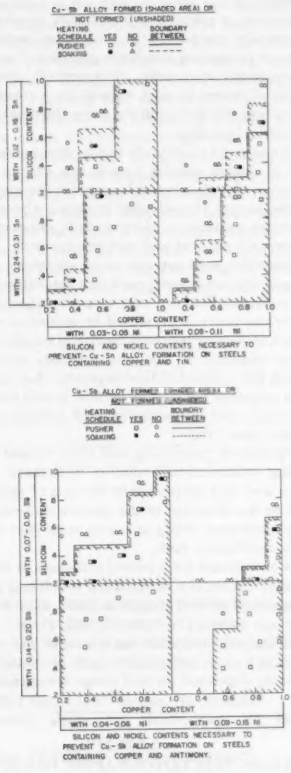
Int. Cl.² C22C *38/08, 38/16*

U.S. Cl. 75—125 **7 Claims**

1. In a method of producing steel having resistance to hot shortness due to the formation of copper-tin and copper-antimony alloys on the steel surface during reheating, said steel containing copper in an amount up to about 1% by weight and a member of the group consisting of tin and antimony, and mixtures thereof, tin and antimony being present in amounts of up to about 0.31% and up to about 0.20% respectively, and when both are present, the total not exceeding about 0.10% for steels containing up to 1% Cu and not exceeding 0.20% for steels containing up to 0.5% Cu, which method includes melting and solidification, the improvement comprising:

in the melting step, adjusting the content of silicon and

nickel in the steel to from about 0.2% to about 1.0% for the silicon, and from about 0.03% to about 0.15% for the


Cu-Sb ALLOY FORMED (SHADED AREA) OR NOT FORMED (UNSHADED)
HEATING SCHEDULE
YES
NO
BOUNDARY BETWEEN
PUSHER
SOAKING
SILICON CONTENT
WITH 0.02 - 0.16 Sn
WITH 0.24 - 0.31 Sn
COPPER CONTENT
WITH 0.03 - 0.05 Ni
WITH 0.08 - 0.11 Ni
SILICON AND NICKEL CONTENTS NECESSARY TO PREVENT Cu-Sn ALLOY FORMATION ON STEELS CONTAINING COPPER AND TIN.
Cu-Sb ALLOY FORMED (SHADED AREA) OR NOT FORMED (UNSHADED)
HEATING SCHEDULE
YES
NO
BOUNDARY BETWEEN
PUSHER
SOAKING
SILICON CONTENT
WITH 0.07 - 0.10 Sb
WITH 0.14 - 0.20 Sb
COPPER CONTENT
WITH 0.06 - 0.08 Ni
WITH 0.09 - 0.15 Ni
SILICON AND NICKEL CONTENTS NECESSARY TO PREVENT Cu-Sb ALLOY FORMATION ON STEELS CONTAINING COPPER AND ANTIMONY.

nickel, said ranges selected falling within the unshaded portions of the graphs of FIGS. **1** and **2**.

3,909,252

WEAR-RESISTANT CAST IRON FOR SLIDING SURFACES

Ichizo Kuriyama, Hamamatsu, and Yasunobu Mori, Shizuoka Prefecture, both of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka-Prefecture, Japan

Filed Oct. 29, 1974, Ser. No. 518,514

Claims priority, application Japan, Nov. 1, 1973, 48-123204

Int. Cl.[2] C22C *38/44, 38/48, 38/52, 38/56*

U.S. Cl. 75—128 B **1 Claim**

1. A cast iron for use in a sliding contact surface of a first mechanical part adapted to cooperatively contact in sliding motion with a compositely electroplated layer wherein nickel and a silicon carbide are coprecipitated of a corresponding second mechanical part, said layer being subjected to surface treatment thereby to cause particles of said silicon carbide to protrude from above the surface of the nickel constituting a matrix in said electroplated layer, said cast iron consisting essentially of 1.0 to 3.5 percent of total carbon, 0.5 to 3.0 percent of silicon, 0.1 to 1.5 percent of manganese, 0.1 to 2.0 percent of chromium, 1.0 to 15.0 percent of cobalt, 0.5 to 10.0 percent of molybdenum, 0.1 to 5.0 percent of nickel, 0.05 to 2.0 percent of niobium, 0.001 to 0.1 percent of boron, and a remainder of iron and impurities, all percentages being by weight.

3,909,253

WELDING WIRE

Avraam Efimovich Asnis, Bulvar Lesi Ukrainki, 2, kv. 5; Jury Yakovlevich Gretsky, ulitsa Semashko, 21, kv. 116; Evgeny Petrovich Kuznetsov, Anri Barbjusa, 22/26, kv. 86; Nikolai Alexandrovich Slavinsky, ulitsa Aviatsii, 41, kv. 24, and Igor Mikhailovich Melnichenko, ulitsa Krasnoarmeiskaya, 136, kv. 5, all of Kiev, U.S.S.R.

Filed July 19, 1974, Ser. No. 489,887

Claims priority, application U.S.S.R., July 19, 1973, 1946984

Int. Cl.[2] C22C *19/03*

U.S. Cl. 75—170 **4 Claims**

1. A welding wire for welding cast iron, based on nickel and consisting essentially of in the following weight percent:

manganese	0.5 – 10
copper	0.2 – 5.0
iron	0.05 – 15.0

and at least one metal in the amount of 0.1 – 0.5 weight percent selected from the group consisting of rare-earth metals with the balance being nickel.

3,909,254

LASER RECORDING METHOD

Yasuo Tamai; Masaaki Takimoto; Akira Nahara, all of Tokyo, Japan, and Masamichi Sato, Tucson, Ariz., assignors to Rank Xerox Ltd., London, England

Filed Mar. 19, 1973, Ser. No. 342,634

Claims priority, application Japan, Dec. 28, 1970, 45-120326

Int. Cl.[2] G03G *5/08*

U.S. Cl. 96—1 R **9 Claims**

1. An electrophotographic imaging process comprising providing a photoconductive material having presistent conductivity properties such that after said material is irradiated with actinic radiation conductivity in the exposed areas temporarily persists, irradiating said material with a laser beam image-wise, uniformly charging said material and developing said material.

3,909,255

ELECTROLYTICALLY INDUCED POLYMERIZATION UTILIZING ZINC AND ALKALI METAL SULFITE

Steven Levinos, Summit, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Dec. 3, 1973, Ser. No. 421,294

Int. Cl.[2] G03G *13/22;* **G05C** *5/00*

U.S. Cl. 96—1 E **4 Claims**

1. A method of forming a polymeric image of a polymerizable ethylenically unsaturated compound which comprises:

a. combining said compound in a composition comprising an alkali metal sulfite;

b. disposing said composition as a layer upon an electrically conductive body comprising metallic zinc; and

c. in an electrolytic circuit wherein said conductive body comprises the anode, subjecting said composition layer to the passage of an electrical current in accordance with a pattern corresponding to the image to be formed.

3,909,256
ELECTROSTATOGRAPHIC PROCESS FOR PREPARING SCREEN PRINTING MEMBER

John B. Wells, Savannah, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 427,591
Int. Cl.[2] G03G *13/26*
U.S. Cl. 96—1 R **12 Claims**

1. A method for preparing a stencil comprising providing a suitable screen, coating the voids of said screen with a liquid material hardenable at ambient or elevated temperature which is impervious to a printing fluid and not dissolvable by said printing fluid and which has a viscosity and conductivity sufficient to permit removal by electrostatic attraction, said conductivity being less than 10^{13} ohm/cm, contacting said coated screen in the absence of light with a member having an electrostatographic latent image separating the members whereby liquid is removed from the screen by electrostatic attraction in the charged areas of the image to provide voids in image configuration and hardening the liquid in the non-charged areas to form an imaged stencil.

3,909,257
MANIFOLD IMAGING PROCESS WITH SPOOL ELECTRODE

James R. Davidson, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 872,850, Oct. 31, 1969, Pat. No. 3,642,363. This application June 25, 1971, Ser. No. 157,054
Int. Cl.[2] G03G *13/22*
U.S. Cl. 96—1 M **10 Claims**

1. An imaging process wherein a manifold set comprising an imaging layer, structurally fracturable in response to the combined effects of an applied electric field and exposure to electromagnetic radiation to which said layer is sensitive is sandwiched between a continuous web donor layer and a continuous web receiver layer, at least one of said layers being at least partially transparent to said electromagnetic radiation comprising:

a. providing a flat backing electrode and, in operative association, a flexible tape electrode wound on a traveling spool, at least one of said electrodes being at least partially transparent to electromagnetic radiation to which said imaging layer is sensitive;

b. sandwiching said manifold set between said electrodes by placing one side of said sandwich against said backing electrode and moving said traveling spool across the opposite side of said sandwich whereby said tape electrode unwinds from said spool and covers said side whereby said set is held in a stationary position;

c. applying an electric field across said imaging layer and exposing said layer to an imagewise pattern of electromagnetic radiation to which said layer is sensitive;

d. winding said tape electrode onto said spool; and

e. separating said sandwich while holding one web stationary whereby said imaging layer fractures in imagewise configuration providing a positive image on one of said donor and receiver layers and a negative image on the other layer.

3,909,258
ELECTROGRAPHIC DEVELOPMENT PROCESS

Arthur R. Kotz, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 234,778, March 15, 1972. This application Jan. 2, 1974, Ser. No. 430,044
Int. Cl. G03g *13/08, 13/22*
U.S. Cl. 96—1 R **19 Claims**

1. A process for applying toner material selectively to predetermined areas of one surface of a layer of material comprising:

1. providing one surface of a layer of material with areas thereof having an electrical potential with respect to the other surface of said layer in a range defining image areas and other areas thereof having an electrical potential with respect to the other surface of said layer in a range defining non-image areas, said areas defining an electrical potential pattern corresponding to the pattern to be produced,

2. providing a cylindrical electrically conductive support electrically connected to said other surface with said support presenting a uniform quantity of one-component magnetically attractable, electronically conductive toner material bound to said support by a magnetic force of attraction which is uniform along the axial length of said cylindrical support,

3. arranging said electrically conductive support adjacent to and in spaced relation to said one surface at a uniform distance therefrom of at least twice the major dimension of the largest of said toner material whereby said toner material provides a electronically conductive path between said support and said one surface,

4. establishing said support at an electrical potential of a magnitude and polarity such that the difference in electrical potential between said support and said one surface, when the toner is presented in accordance with steps 2 and 3, induces a transient electrical transfer force on said toner material in said electronically conductive path, which for a period of time is greater than and opposed to said magnetic force of attraction in said image areas and less than said magnetic force of attraction in said non-image areas, and

5. progressively presenting said layer to said toner by providing unidirectional relative movement between said layer and said support with the axis of said support normal to the direction of the relative movement, said relative movement being at a rate such that said electronically conductive path

a. is maintained for a period sufficient to allow said transient electrical transfer force which is greater than and opposed to said magnetic force of attraction in said image areas to be induced, and

b. is discontinued while such level of said transient electrical force exists whereby said toner material is selectively deposited on said image areas of said surface.

3,909,259
COLOR ELECTROPHOTOGRAPHIC IMAGING PROCESS UTILIZING SPECIFIC CARRIER-TONER COMBINATIONS

Joseph Mammino, Penfield; Franklin Jossel; James M. Kobey, both of Rochester; John P. Serio, Webster; Warren E. Solodar, Rochester, and Alan H. Walker, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 17, 1973, Ser. No. 425,481The portion of the term of this patent subsequent to Apr. 16, 1991, has been disclaimed.
Int. Cl.[2] G03G *13/01*
U.S. Cl. 96—1.2 **8 Claims**

1. A color electrophotographic imaging process comprising charging a photoconductive member, exposing said photoconductive member to an original to be reproduced through a filter of one color thereby selectively discharging said photoconductive member, developing the electrostatic image formed thereby with a developer of a complementary color, said developer being one member of the group consisting of copper phthalocyanine pigment identified in the Colour Index as CI74160, CI Pigment Blue 15, cyan toner and a methyl terpolymer coated steel carrier; anthraquinone dye identified in the Colour Index as CI60710, CI Disperse Red 15, magenta toner and a nickel berry carrier; and monoazo dye identified in the Colour Index as CI12700, CI Solvent Yellow 16, yellow toner and a methyl terpolymer coated steel carrier; charging said photoconductor for a second time and selectively exposing said photoconductor to the same image through a filter of another primary color, developing the latent electrostatic

image formed thereby with a developer of a complementary color, said developer being another member selected from the group consisting of copper phthalocyanine pigment identified in the Colour Index as CI74160, CI Pigment Blue 15, cyan toner and a methyl terpolymer coated steel carrier; anthraquinone dye identified in the Colour Index as CI60710, CI Disperse Red 15, magenta toner and a nickel berry carrier; and monoazo dye identified in the Colour Index as CI12700, CI Solvent Yellow 16, yellow toner and a methyl terpolymer coated steel carrier; charging said photoconductive member for a third time, exposing said photoconductor to the same image through a filter of the remaining primary color and developing the latent electrostatic image with a complementary developer, said developer being the remaining developer of the group consisting of copper phthalocyanine pigment identified in the Colour Index as CI74160, CI Pigment Blue 15, cyan toner and a methyl terpolymer coated steel carrier; anthraquinone dye identified in the Colour Index as CI60710, CI Disperse Red 15, magenta toner and a nickel berry carrier; and monoazo dye identified in the Colour Index as CI12700, CI Solvent Yellow 16, yellow toner and a methyl terpolymer coated steel carrier.

3,909,260

SENSITIZER FOR USE IN ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yoshio Seoka; Syu Watarai, and Hisatake Ono, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

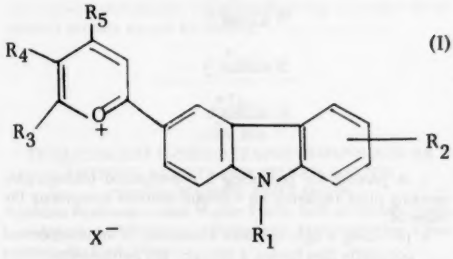
Filed Oct. 15, 1973, Ser. No. 406,267

Claims priority, application Japan, Oct. 17, 1972, 47-103809

Int. Cl.[2] G03G *5/04;* **C07D** *209/82*

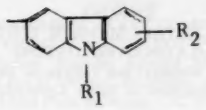
U.S. Cl. 96—1.5 **7 Claims**

1. An electrophotographic light-sensitive element comprising a support having thereon a layer of an organic photoconductor containing a sensitizer comprising a pyrylium salt containing a carbazole nucleus represented by the following general formula (I):

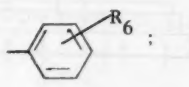


(I)

wherein R_1 represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, a haloalkyl group having from 1 to 5 carbon atoms, a cyanoalkyl group having from 2 to 6 carbon atoms, a hydroxyalkyl group having 1 to 5 carbon atoms, or an acyl group; R_2 represents a hydrogen atom, a halogen atom or a nitro group; R_3 represents



R_4 represents a hydrogen atom or a hydroxy group; or R_3 and R_4 when taken together form a substituted or unsubstituted benzene or naphthalene ring, said substituents being an alkyl group having 1 to 5 carbon atoms, an alkoxy group having 1 to 3 carbon atoms, a nitro group or a halogen atom; R_5 represents a hydrogen atom or



R_6 represents a hydrogen atom, a halogen atom, an amino group, an alkylamino group having from 1 to 4 carbon atoms or an alkyl group having 1 to 5 carbon atoms; X represents Cl^-, Br^-, I^-, ClO_4^-, NO_3^-, HSO_4^- or BF_4^-.

3,909,261

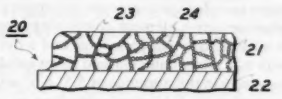
XEROGRAPHIC IMAGING MEMBER HAVING PHOTOCONDUCTIVE MATERIAL IN INTERLOCKING CONTINUOUS PATHS

Robert N. Jones, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 75,390, Sept. 25, 1970, Pat. No. 3,787,208, which is a continuation-in-part of Ser. No. 627,664, April 3, 1967, abandoned. This application Dec. 26, 1973, Ser. No. 427,767

Int. Cl.[2] G03G *5/05*

U.S. Cl. 96—1.5 **8 Claims**



1. A xerographic imaging member which includes a photoconductive insulating layer, said layer comprising an electrically insulating organic resin matrix and a photoconductive material in the form of a matrix of electrically active organic material containing finely divided photoconductive particles therein, said electrically insulating organic resin matrix and said electrically active organic material being not substantially miscible or soluble in each other, said electrically active organic material being substantially transparent to imaging light, said electrically active organic material capable of accepting injection of photo-excited carriers and allowing transport of said carriers through said material, substantially all of the photoconductive material in said member being in the form of a multiplicity of interlocking photoconductive continuous paths through the thickness of said layer, said photoconductive paths being present in a volume concentration, based on the volume of said layer, of from about 1 to 25 percent, with the outer surface of said layer comprising organic resin material.

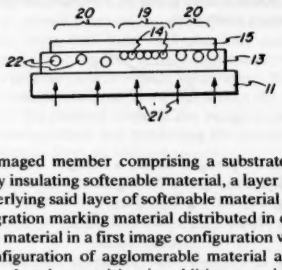
3,909,262
IMAGED MIGRATION MEMBER EMPLOYING A GELATIN OVERCOATING

William L. Goffe, Webster, and George A. Brown, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 97,866, Dec. 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 172, Jan. 2, 1970, abandoned. This application Dec. 12, 1973, Ser. No. 423,958

Int. Cl.² G03G *5/00*

U.S. Cl. 96—1.5 **11 Claims**



1. An imaged member comprising a substrate, a layer of electrically insulating softenable material, a layer consisting of gelatin overlying said layer of softenable material and agglomerable migration marking material distributed in depth in said softenable material in a first image configuration with said first image configuration of agglomerable material agglomerated and/or fused and comprising in addition to said first image configuration, an unagglomerated complementary background pattern of agglomerable migration marking material remaining substantially unagglomerated contactng the gelatin layer - softenable layer interface.

3,909,263
5,5′,6,6′-TETRAHYDROXY-3,3,3′,3′-TETRAMETHYL-BIS-SPIROHYDRINDENE AUXILIARY DEVELOPERS

Yoshinobu Yoshida, and Tadao Shishido, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 14, 1973, Ser. No. 424,961

Claims priority, application Japan, Dec. 14, 1972, 47-125611

Int. Cl.² G03C *7/00, 5/54, 5/30, 1/40*

U.S. Cl. 96—3 **16 Claims**

1. A diffusion transfer color process comprising imagewise exposing a photosensitive element comprising a support having at least a silver halide emulsion layer and a dye developer associated with said silver halide in said silver halide emulsion layer and processing in the presence of 5,5′,6,6′-tetrahydroxy-3,3,3′,3′-tetramethyl-bis-1,1′-spirohydrindene as an auxiliary developing agent, which auxiliary developing agent is present in an alkaline processing solution permeable layer of said element during processing and is in reactive association with said silver halide, the exposed photosensitive element in a superposed relation with an image-receiving element with a liquid alkaline composition to immobilize the dye developer in the exposed areas of the silver halide emulsion layer and to transfer by diffusion the dye developer in the unexposed areas of the silver halide emulsion layer to the image-receiving element.

3,909,264
DYE DEVELOPER PROCESSES AND PRODUCTS USING NAPHTH[1,2-D]IMIDAZOLE

Stanley M. Bloom, Waban, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1973, Ser. No. 428,382

Int. Cl.² G03C *7/00, 1/48, 5/30, 1/40*

U.S. Cl. 96—3 **11 Claims**

1. A diffusion transfer color process comprising exposing a photosensitive element comprising a blue-sensitive silver halide emulsion having a yellow dye developer associated therewith, a green-sensitive silver halide emulsion having a magenta dye developer associated therewith, and a red-sensitive silver halide emulsion having a cyan dye developer associated therewith, applying an aqueous alkaline processing composition to said exposed photosensitive element to effect development and to form an imagewise distribution of unoxidized dye developer in undeveloped areas of each of said silver halide emulsions as a function of said development, said process including the step of transferring by diffusion at least a portion

of said imagewise distributions of unoxidized dye developer to an image-receiving layer in superposed relationship therewith to thereby provide a multicolor diffusion transfer image, said aqueous alkaline processing composition containing naphth[1,2-d]imidazole and contacting said blue-sensitive silver halide emulsion before contacting said green-sensitive and red-sensitive silver halide emulsions.

3,909,265
PROCESS FOR PRODUCING PRESENSITIZED PLANOGRAPHIC PRINTING PLATE REQUIRING NO FOUNTAIN SOLUTION

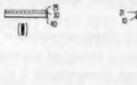
Shizuo Miyano; Shinzo Kishimoto; Kenichiro Yazawa, and Asaji Kondo, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

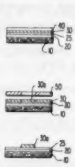
Filed Dec. 12, 1973, Ser. No. 424,027

Claims priority, application Japan, Dec. 13, 1972, 47-124913

Int. Cl.² G03F *7/02, 1/00*

U.S. Cl. 96—33 **9 Claims**





1. A process for producing a presensitized planographic printing plate requiring no fountain solution comprising the steps of:

a. providing a light-sensitive substance on an unsupported polyolefin film having a nitrogen gas permeability of not less than 0.2 $g/m^2 \cdot 24$ hr. .1 atm.;

b. providing a silicone gum layer on a support;

c. contacting said light-sensitive substance layer and said silicone gum layer; and

d. hardening said silicone gum to a silicone rubber while pressing said light-sensitive substance layer against said silicone gum layer.

3,909,266

RECORDING MEMBER OF PHOTOCOLOR DEVELOPING AND ELIMINATING MATERIAL AND THE RECORDING METHOD

Eiichi Inoue, Tokyo, and Isamu Shimizu, Fuchu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 705,758, Feb. 15, 1968, abandoned, which is a continuation-in-part of Ser. No. 630,519, April 1, 1967, abandoned. This application Jan. 22, 1973, Ser. No. 325,304

Claims priority, application Japan, Apr. 14, 1966, 41-23217; May 31, 1967, 42-35075; Feb. 20, 1967, 42-11070

Int. Cl.² G03C 5/32, 1/52

U.S. Cl. 96—45.2 11 Claims

1. A process which comprises irradiating a recording member including in the photosensitive layer a photochromic material selected from the group consisting of carbinols, cyanides, sulfides, spiropyrans, anils, nitrobenzyl pyridines, azobenzenes, stilbene and bianthrones by at least one radiation through an original image pattern to form an image on the recording member and treating the resulting image with a basic material or an anionic material selected from the group consisting of sodium hydroxide, potassium hydroxide, ammonia and amino compounds to fix said image as a permanent image, said photochromic material having a property that when irradiated by a radiation of a specific absorption wavelength range, it obtains an absorption wavelength in the visible light region, thereby being color-developed and the color-developed state is eliminated when irradiated by a radiation of a wavelength range different from that of the previously applied radiation.

3,909,267

STABILIZATION PROCESS FOR COLOR PHOTOGRAPHIC MATERIALS

Haruhiko Iwano; Kazuo Shirasu, and Tadao Hatano, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 13, 1973, Ser. No. 424,253

Claims priority, application Japan, Dec. 13, 1972, 47-124915

Int. Cl.² G03C 7/00

U.S. Cl. 96—56 11 Claims

1. A stabilization process for a color photographic material having silver halide emulsion layers containing color couplers which react with an oxidation product of a color developer to form color images which comprises processing said color photographic material, after developing and bleaching, with a bath having a pH of 2.7 to 4.5 containing (1) a water-soluble zirconium salt and (2) a polycarboxylic acid or a salt thereof, said stabilization process being the final step in a color development process except for rinsing.

3,909,268

TETRAZOLIUM C-OXY-BETAINE COMPOUNDS AS ANTIFOG AGENTS FOR SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Agostino Baldassarri, and Walter Ferro, both of Savona, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 29, 1974, Ser. No. 465,185

Claims priority, application Italy, May 7, 1973, 49830/73

Int. Cl.² G03C 1/34

U.S. Cl. 96—76 R 17 Claims

1. A silver halide photographic emulsion having in reactive contact therewith at least a fog-inhibiting amount of a tetrazolium C-oxy-betaine compound.

3,909,269

LITHOGRAPHIC PLATE COMPRISING A LIGHT-SENSITIVE POLYMER

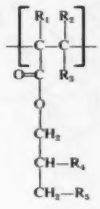
Edward H. Parker, Ballwin; Edward M. Harris, Webster Groves, and Jim D. Meador, Bridgeton, all of Mo., assignors to Western Litho Plate & Supply Co., St. Louis, Mo.

Division of Ser. No. 272,796, July 18, 1972, Pat. No. 3,852,256. This application Nov. 13, 1973, Ser. No. 415,356

Int. Cl.² G03C 1/70, 1/52

U.S. Cl. 96—86 P 8 Claims

1. A lithographic plate which comprises a base plate having a coating on the surface thereof comprising a light-sensitive polymer susceptible to crosslinking upon exposure to actinic light containing the recurring unit:



wherein R_1, R_2, and R_3 are each selected from the group consisting of hydrogen, halogen and lower alkyl, and at least one of R_4 and R_5 is selected from the group consisting of azidobenzoyloxy and azidonaphthoyloxy, the other of R_4 and R_5 being selected from the group consisting of hydroxyl, halogen, alkoxy, aryloxy, aralkoxy, alkoxyalkoxy, aryloxyalkoxy, alkoxyaryloxy, aryloxyaryloxy, alkylacyloxy, arylacyloxy, alkenylacyloxy, aralkenylacyloxy, heterocyclic substituted alkenylacyloxy, azidobenzoyloxy and azidonaphthoyloxy.

3,909,270

DICHROIC REVERSIBLE PHOTOSENSITIVE MATERIALS

Yasuo Kishi, Hirakata; Toshiaki Yokoo, Osaka; Terutoyo Imai, Neyagawa; Keiichi Kanatani, Hirakata, and Takehito Yazaki, Katano, all of Japan, assignors to Director of Agency of Industrial Science & Technology, Japan

Filed Aug. 28, 1973, Ser. No. 392,302

Claims priority, application Japan, Aug. 30, 1972, 47-86608

Int. Cl.² G03C 1/00

U.S. Cl. 96—88 10 Claims

1. A dichroic reversible photosensitive material, which consists of an alkali metal halide crystal having M-centers, said crystal containing an alkali metal ion having a smaller ion radius than that of the alkali metal in said alkali metal halide and one or more metal ions which possess the ability to act as an electron trap selected from the group consisting of alkali earth metal ions and transition metal ions.

3,909,271

HEAT DEVELOPABLE PHOTOGRAPHIC MATERIAL CONTAINING SENSITIZERS

Shinpei Ikenoue, and Takao Masuda, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 31, 1974, Ser. No. 438,320

Claims priority, application Japan, Jan. 31, 1973, 48-12587

Int. Cl.² G03C 1/06

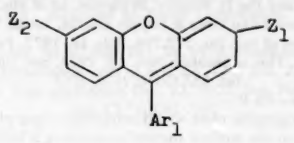
U.S. Cl. 96—95 15 Claims

1. A sensitized heat developable photographic material comprising a support having thereon at least one photographic layer containing the following components:

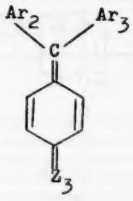
a. an organic silver salt,

b. a catalytic amount of a photosensitive silver halide or a compound which reacts with said organic silver salt (a) to produce a photosensitive silver halide,

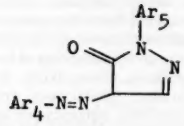
c. a reducing agent,
d. a binder, and
e. at least one compound of the following formulae:



(I)

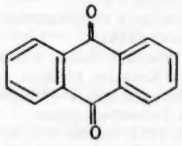


(II)



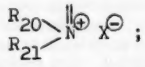
(III)

and

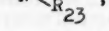


(IV)

wherein Z_1 and Z_3 each represents —O or



Z_2 represents —OM or



Ar_1, Ar_2, Ar_3, Ar_4 and Ar_5 each represents an unsubstituted or substituted aryl group;

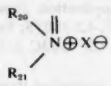
X^- represents an anion; and

R_{20}, R_{21}, R_{22} and R_{23} each represents an unsubstituted or substituted alkyl group or an unsubstituted or substituted aryl group; with the proviso that when Z_1 is =O, Z_2 is —OM, and Ar_1 does not contain a halogen substituent, and the nuclei in the formula (I) contain two halogen atoms;

Ar_1 contains at least one of SO_3M and COOM as a substituent; at least one of Ar_2 and Ar_3, and at least one of Ar_4 and Ar_5 each contains at least one of SO_3M and COOM as a substituent;

the formula (IV) contains at least one of SO_3M and COOM as a substituent in the nuclei thereof or in the substituent(s) on the nuclei thereof;

M represents a hydrogen atom, an alkali metal atom, an alkaline earth metal atom, or an NH_4 group, and each nucleus of the formulae (I) through (IV) can further contain additional substituent(s) other than the above defined substituents, and the radical



can be in the form of an inner salt.

3,909,272

PHOTOGRAPHIC ELEMENTS, COMPOSITIONS AND PROCESSES

Arthur H. Herz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,037
Int. Cl.[2] G03C *1/38*
U.S. Cl. 96—114.5 **22 Claims**

1. An unexposed radiation-sensitive silver halide emulsion containing a hydrophilic colloid and a sulfoxide having the formula

$$R_1—SO—R_2$$

in which R_1 is alkyl having 8 – 18 carbon atoms, aryl having 6 – 14 carbon atoms, or aralkyl having 7 – 16 carbon atoms and R_2 is alkyl having 1 – 14 carbon atoms, aryl having 6 – 14 carbon atoms or aralkyl having 7 – 16 carbon atoms and R_1 plus R_2 contain more than 8 carbon atoms.

3,909,273

PHOTOPOLYMERIZATION UTILIZING DIAZOSULFONATE AND AROMATIC HYDROXY COMPOUNDS

Steven Levinos, Summit, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed July 23, 1973, Ser. No. 381,452
Int. Cl.[2] G03C *1/70*
U.S. Cl. 96—115 P **8 Claims**

1. A polymerizable composition comprising:
a. an ethylenically unsaturated vinyl compound; and
b. a photo-sensitive polymerization initiator comprising a combination of:
1. a light-sensitive aromatic diazo-N-sulfonate, and
2. an aromatic hydroxy compound.

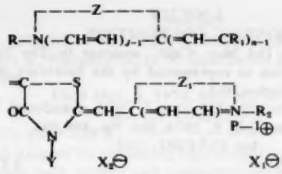
3,909,274

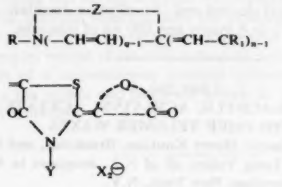
SILVER HALIDE EMULSION CONTAINING TRINUCLEAR RHODANINE NUCLEUS DYES SOLUBLE IN LOW-MOLECULAR WEIGHT ALCOHOLS

Paolo Beretta, Ferrania, and Luigi Magnani, Carcare, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 2, 1973, Ser. No. 320,575
Claims priority, application Italy, Jan. 4, 1972, 47546/72
Int. Cl.[2] G03C *1/10*
U.S. Cl. 96—127 **4 Claims**

1. A silver halide photographic emulsion characterized by the fact that the emulsion contains at least one low-molecular weight alcohol soluble trinuclear dye corresponding to the general formula:

[1] 

[2] 

wherein:

Z and Z_1 each represent the non-metallic atoms necessary to complete a 5 or 6 member heterocyclic nucleus;

Q represents the non-metallic atoms necessary to complete a 5 or 6 member Kelomethylene nucleus;

R and R_2 each represent a substituted or not substituted alkyl group having from 1 to 8 carbon atoms;

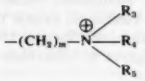
R_1 represents a hydrogen atom or an alkyl group;

J, *p*, *q* represent 1 and 2;

n represents 1, 2, 3 and 4;

X_1^- and X_2^- represent an acid anion; and

Y represents a group having the following formula:



wherein:

R_3, R_4, R_5 equal or different, each represent an alkyl group having from 1 to 6 carbon atoms, and m represents 2, 3 and 4.

3,909,275

CYANINE DYE SALTS, MEROCYANINE DYES, AND THEIR USE IN SILVER HALIDE PHOTOGRAPHIC EMULSIONS

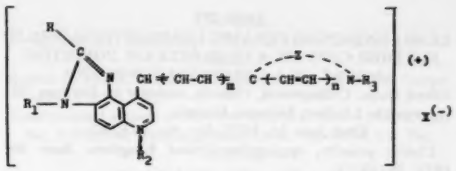
Mario Gandino, Ferrania, and Luigi Magnani, Carcare, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 3,202, Jan. 15, 1970, abandoned. This application Apr. 20, 1972, Ser. No. 245,795

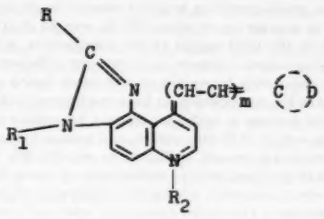
Int. Cl.² G03C *1/16, 1/22*

U.S. Cl. 96—131 **13 Claims**

1. A silver halide photographic emulsion containing a sensitizing dye of the formula



or



wherein R and R_1 each individually represent a hydrogen atom or an alkyl group; R_2 and R_5 each individually represent an alkyl group; *m* is 0, 1, or 2; *n* is 0 or 1; Z represents the atoms necessary to complete a 5 or 6 membered heterocyclic ring; X represents an acid radical; and D represents atoms required to complete a ketomethylene heterocyclic nucleus having a 5 or 6 membered heterocyclic ring.

3,909,276

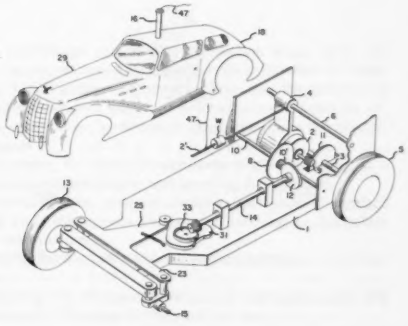
REMOTE CONTROL TOY

Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055

Filed Nov. 6, 1974, Ser. No. 521,526

Int. Cl.² A63H *29/22, 30/00*

U.S. Cl. 46—244 R **23 Claims**



23. A toy vehicle according to claim **20**, said arm having a forwardly directed hook-shaped claw member at its lower end.

3,909,277
LEAD CONTAINING CERAMIC COMPOSITIONS WHICH FURTHER CONTAIN A LEAD RELEASE INHIBITING AMOUNT OF A CHROMIUM COMPOUND

Alfred Dube, Collingwood, Canada, assignor to Heritage Silversmiths Limited, Toronto, Canada

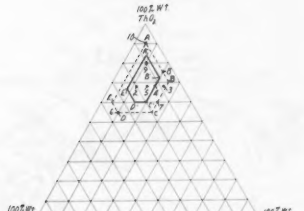
Filed June 26, 1973, Ser. No. 373,742
Claims priority, application United Kingdom, June 26, 1972, 29748/72
Int. Cl.² C03C *5/02, 3/10*
U.S. Cl. 106—49 **20 Claims**

1. In a lead-releasing colored ceramic composition formed from a plurality of glass-forming components including a copper oxide-providing material present in an amount sufficient to provide up to about 3% by weight of copper oxide based on the total weight of the composition, a lead oxide-providing material present in an amount sufficient to provide up to about 40% by weight of lead oxide based on the total weight of the composition, at least one fluxing oxide-providing material present in sufficient amount to provide up to about 25% by weight of fluxing oxides, and a silica-forming material present in an amount sufficient to provide the balance by weight of the glass-forming components of silica, the improvement which comprises adding to said plurality of glass-forming components a chromium compound selected from the group consisting of barium chromate, calcium chromate, strontium chromate, iron chromate, cobalt chromate, silver chromate, cupric chromate, zinc chromate and chromic oxide, said chromium compound being added in an amount sufficient to effect a lead release of less than 7 ppm and in an amount insufficient to alter substantially the color and visual appearance of said composition in the absence of such chromium compound.

3,909,278
HIGH DENSITY THORIA-SILICA-METAL (III) OXIDE FIBERS

Donald D. Johnson, Chisago City, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 28, 1973, Ser. No. 429,197
Int. Cl. C04b *35/50*
U.S. Cl. 106—65 **14 Claims**



1. A shaped and fired, continuous thoria-silica-alumina-boria fiber comprising thoria and silica together in major amount weight ratio of 1.5 : 1 to 10 : 1, 5 to 25 percent by weight of alumina and boria together in mole ratio of about 3 : 1 and 0 to 2 percent by weight Cr_2O_3.

3,909,279
BONDING COMPOSITION

Serop Manjiklan, Del Mar, Calif., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 292,231, Oct. 3, 1972, abandoned. This application July 5, 1974, Ser. No. 486,041
Int. Cl.² C08L *1/08*
U.S. Cl. 106—180 **1 Claim**

1. A bonding composition consisting essentially of (1) about 85 to 95 parts by volume of triacetin, (2) about 5 to 15 parts of volume of propyl alcohol and (3) cellulose diacetate in an amount of about 2 to 6 grams per 100 ml of triacetin.

3,909,280
ETHYLENE-ACRYLIC ACID-VINYL ACETATE TERPOLYMER TELOMER WAXES

John E. Dench, Dover; Harry Knutson, Brookside, and Manfred K. Seven, Long Valley, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed July 9, 1971, Ser. No. 161,320
Int. Cl.² C08L *91/06;* **C09D** *3/387*
U.S. Cl. 106—271 **9 Claims**

1. A terpolymer telomer wax of ethylene containing from 2 to 7 mol % of acrylic acid and 0.5 to 8 mol % of vinyl acetate, both based on mols of ethylene having a molecular weight between about 2000 and 5000 and viscosity of from about 100 to 1500 centipoises at 140°C.

3,909,281
PROCESS FOR PREPARING A CARBON BLACK COMPOSITION

Takeshi Yamawaki, Yokohama; Tatsuo Masuko, Yokkaichi; Osami Yanagida, Yokkaichi; Syunji Yamamoto, Yokkaichi; Jihei Inomata, Komae, and Susumu Michishima, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Feb. 4, 1974, Ser. No. 439,027
Claims priority, application Japan, Feb. 6, 1973, 48-15079; Sept. 19, 1973, 48-105784; Oct. 19, 1973, 48-117673
Int. Cl.² C09D *3/00;* **C08K** *3/04*
U.S. Cl. 106—285 **13 Claims**

1. A process for preparing a liquid rubber-carbon black composition which comprises mixing 30–300 parts by weight of carbon black in the form of an aqueous carbon black slurry with 100 parts by weight of a liquid conjugated diene, copolymerized diene rubber or polysulfide rubber having a molecular weight of from 500–30,000 and a viscosity at 24°–100°C of from 0.3–1000 poise with stirring said carbon black composition being prepared by effectively utilizing water as a medium for the uniform mixing of said rubber and said carbon black.

3,909,282
COLORANTS FOR PHOTOPOLYMERIZED IMAGES

Russell Houston Gray, Rumson, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 285,617, Sept. 1, 1972, abandoned. This application Mar. 14, 1973, Ser. No. 341,251
Int. Cl.² C09D *3/00*
U.S. Cl. 106—288 Q **15 Claims**

1. A colorant of predictable reflection density comprising a mixture of at least one inert powder selected from organic and silicone compounds having an average particle size of 1 to 1000 microns and at least two particulate, pigmented resins having different reflection densities, said colorant being made by mixing said pigmented resins together, at least one of said pigmented resins containing at least one said inert powder before mixing, said inert powder being unreactive with said pigmented resins and being present in said mixture in an amount of 0.1 to 100 parts of inert powder per part, by volume, of one of said pigmented resins.

3,909,283

PRODUCING LIGHTWEIGHT AGGREGATE

Wilbert E. Warnke, 14213 N. Gate Drive, Silver Spring, Md. 20906

Filed Mar. 4, 1974, Ser. No. 447,742
Int. Cl.[2] C04B *31/02*
U.S. Cl. 106—288 B 10 Claims

1. A process for producing light-weight aggregate of predetermined bulk density and controlled internal pore size in a wide size range of bloated pellets, comprising the steps of pulverizing and mixing of about 90–99 percent by weight of a mineral material selected from the group consisting of clay, shale and certain mineral processing wastes with about 1 to 7 percent by weight of calcium carbonate and 1 to 7 percent by weight of a carbonaceous material, pelletizing the mixture, drying the pellets and firing the pellets to about 2200°F. for about 5 minutes.

3,909,284

LAKE PROCESS

Edward J. Woznicki, Douglassville, and Charles A. Signorino, King of Prussia, both of Pa., assignors to Colorcon Incorporated, West Point, Pa.

Filed Dec. 26, 1973, Ser. No. 427,819
Int. Cl.[2] C09B *63/00*
U.S. Cl. 106—289 17 Claims

1. A method of making dry edible non-toxic color lakes approved for food and drug use and of submicron particle size, comprising the steps of dissolving sodium bicarbonate in water at a temperature not higher than 20°C., stirring aluminum chloride into the sodium bicarbonate solution, the proportion of sodium bicarbonate to aluminum chloride being about 555 to 1,000 in parts by weight, the final pH being about 5.5, precipitating alumina hydrate, stirring a dye solution approved by FDA for ingestion and containing an acid group for forming an aluminum salt into the alumina hydrate slurry, stirring aluminum chloride into the slurry to effect laking, forming a filter cake, washing the filter cake with water to reduce the sodium chloride content thereof, and drying the filter cake to produce a dry cake of agglomerated lake particles, whereby producing a lake which is brighter, more bleed free, more light stable, and of superior tinting strength.

3,909,285

METHOD OF GRAFTING ORGANIC GROUPS ON CALCIUM SILICATES

Jose, Marie, Maurice, Julien Fripiat, Wezembeek-Oppem, Belgium, assignor to Lafarge (Societe Anonyme), Paris, France

Continuation-in-part of Ser. No. 306,735, Nov. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 80,777, Oct. 14, 1970, abandoned. This application Mar. 4, 1974, Ser. No. 447,881
Int. Cl.[2] C09C *1/28*
U.S. Cl. 106—306 24 Claims

1. A method of grafting organosilicon groups onto calcium silicate, comprising contacting intimately calcium silicate with a liquid reaction medium having at least one organosilane or hydrolysable organosiloxane and wherein at least one moiety of which corresponds to the substituted organosilicon groups to be grafted, said siloxane or silane being dissolved in a solvent consisting essentially of an alkanol and a suitable amount of a water soluble calcium salt, said medium being acidified so as to provide an H^+ ion concentration permitting both the hydrolysis of said siloxane or silane and the dissolution of at least a portion of the calcium ions available in the silicate utilized, the reaction being effected at a temperature between ambient temperature and the reflux temperature of the medium and for a reaction time sufficient to permit grafting.

3,909,286

MODIFIED, PRECIPITATED ALUMINO SILICATE PIGMENTS

Robert C. Fitton, Belair, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 198,022, Nov. 5, 1971, Pat. No. 3,798,046. This application Mar. 18, 1974, Ser. No. 452,496
Int. Cl.[2] C09C *1/02, 1/28, 1/40*
U.S. Cl. 106—306 6 Claims

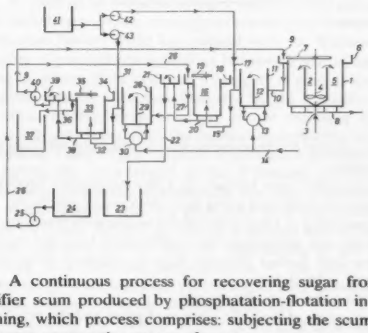
1. A finely divided, precipitated, white powdery composition comprising chemically bound oxides of magnesium, sodium, aluminum, and silicon in a uniform matrix substantially all of the particles of which are less than 1 micron in diameter, the molar ratio of SiO_2 to Na_2O being at least about 4 to 1 and the molar ratio of Na_2O to Al_2O_3 being from about 0.8 to 1.4:1, said magnesium oxide being present in an amount of from about 0.1 to 8 percent based on the dry weight of the composition; said composition having a specific gravity of 2.0 to 2.4; said composition further having an alkalinity in the range of from about 40–60 meq/100 g; a LOI in the range of from about 6–8.5% by weight; an oil absorption in the range of from about 110 to 145 cc/100 g and a surface area in the range of from about 50 to 120 M^2/g.

3,909,287

RECOVERY OF SUGAR FROM CLARIFIER SCUM BY COUNTERCURRENT EXTRACTION

John Trethowan Rundell, Keston; Raymond George Bennett, Swanley; Colin Vesty Rich, Hadlow, and Paul Richmond Pottage, Bromley, all of England, assignors to Tate & Lyle Ltd., London, England

Filed May 7, 1974, Ser. No. 467,662
Claims priority, application United Kingdom, May 11, 1973, 22594/73
Int. Cl.[2] C13D *1/00*
U.S. Cl. 127—57 11 Claims



1. A continuous process for recovering sugar from the clarifier scum produced by phosphatation-flotation in sugar refining, which process comprises: subjecting the scum to at least two consecutive stages of counter-current aqueous extraction, wherein each extraction stage comprises the successive steps of

a. dispersing the scum in desweetening water, to give a homogeneous mixture, and aerating the mixture,
b. distributing an anionic organic polymeric flocculant uniformly throughout the aerated mixture, to flocculate the scum therein,
c. passing the mixture, without further agitation, to a clarifier,
d. allowing the flocculated scum to segregate from the mixture by flotation in the clarifier, and
e. separately removing a clarified dilute sugar solution and flocculated scum from the clarifier;

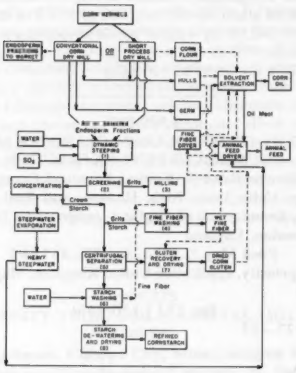
passing the flocculated scum from step (e) of each except the last extraction stage to step (a) of the next extraction stage; passing the dilute sugar solution from step (e) of each except the first extraction stage to step (a) of the immediately pre-

ceding extraction stage, for use as desweetening water therein; discharging the flocculated scum from step (e) of the last extraction stage, as desweetened scum; and recovering the dilute sugar solution from step (e) of the first extraction stage.

3,909,288
PROCESS FOR RECOVERY OF STARCH AND CORN OIL FROM CORN

Eugene L. Powell, Chicago, Ill., and Gerald G. McGeorge, Highland, Ind., assignors to American Maize Products Company, New York, N.Y.

Filed Nov. 5, 1973, Ser. No. 412,734
Int. Cl.[2] C13L *1/02*
U.S. Cl. 127—68 **21 Claims**



1. A process for recovering starch and corn oil from corn comprising:

a. subjecting corn kernals to a dry separation process to separate hulls and germ from endosperm fractions;

b. combining at least some of the endosperm fractions with water and subjecting the combination to a wet steeping step and further process steps to separate corn starch from corn gluten;

c. drying the corn gluten; and

d. subjecting at least the separated germ and the dried corn gluten tp a solvent extraction step to recover corn oil.

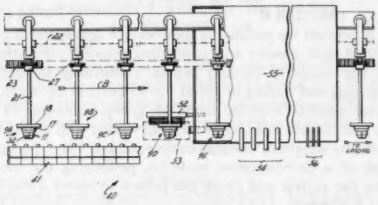
3,909,289
CHUCK CLEANING METHODS

Donald D. Foucart, and Jon R. Cottrill, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed July 12, 1973, Ser. No. 378,678
Int. Cl.[2] B08B *7/04*
U.S. Cl. 134—2 **23 Claims**

15. A method of removing a protective plastic coating material from chucks of the type operable to support and convey glassware through a protective plastic coating process at a predetermined speed, the method comprising the steps of: impinging a flame, burning on a natural gas-oxygen fuel mixture comprising about one part gas and about four parts oxygen, on said chucks, while said chucks are moving at said predetermined speed,

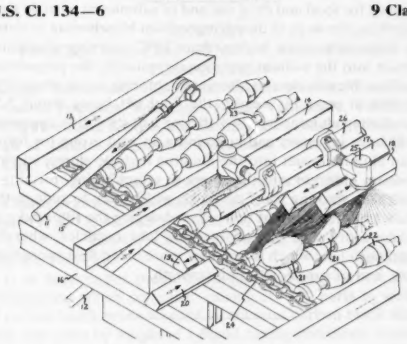
thereby burning and oxidizing said protective plastic coating material in order to remove it so as to maintain said chucks operational.



3,909,290
METHOD AND MEANS FOR WASHING EGGS, INCLUDING TILTED BRUSHES

William S. Peppler, Chappaqua, N.Y., and Hans W. Beinssen, Oyten, Germany, assignors to Diamond International Corporation, New York, N.Y.

Filed Nov. 6, 1973, Ser. No. 413,336
Int. Cl. B08b *1/02*
U.S. Cl. 134—6 **9 Claims**



1. A method of washing eggs comprising the steps of moving eggs on a conveyor beneath a pair of strip brushes tilted from the vertical position in order of about 30°–60°, horizontally reciprocating the brushes in opposite directions from each other while maintaining said brushes in the position tilted from the vertical, while the eggs move thereunder, and

simultaneously spraying a washing solution onto the eggs.

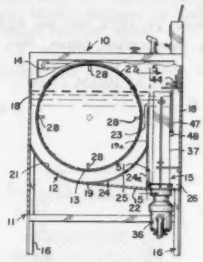
3,909,291
COMESTIBLE CLEANING APPARATUS

Joseph Wing Leong, 17061 Wausau Ave., South Holland, Ill. 60473

Filed Dec. 10, 1973, Ser. No. 423,051
Int. Cl.[2] B08B *3/06*
U.S. Cl. 134—115 G **9 Claims**

1. An apparatus for cleaning and separating refuse from comestibles such as bean sprouts, said apparatus comprising a tank, a wire mesh basket rotatably mounted in said tank for rotation about a horizontal axis and adapted to be loaded with said comestible, a drain in said tank, partition means in said tank separating said drain and said basket, a standpipe extend-

ing from said drain and having an inlet located at a level so that said basket is only partially filled with water, said partitioning means extending to a height no greater than the level of said inlet of said standpipe.



3,909,292
LEAD STORAGE BATTERY

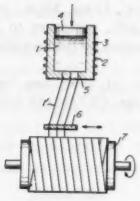
Satoshi Sekido, Kyoto, and Sadao Fukuda, Daito, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 289,051, Sept. 14, 1972. This application Apr. 5, 1974, Ser. No. 458,136

Claims priority, application Japan, Oct. 27, 1971, 46-85352; Nov. 9, 1971, 46-89256; Oct. 27, 1971, 46-99858[U]

Int. Cl.[2] A01M *39/00*

U.S. Cl. 136—27 **11 Claims**



1. A method of manufacturing a lead storage battery, comprising the steps of:

forming electrode plates of non-woven lead fibers to a desired size and shape;

hard pressing the periphery of said plates to a greater density than the remainder of said plates;

welding lead out pieces to a portion of said hard-pressed peripheral portion of said plates;

covering said hard-pressed peripheral portions and lead out pieces with a synthetic resin film;

anodizing said electrode plates;

electrolytically reducing said anodized plates;

incorporating said reduced plates and an electrolytic solution into a container; and

charging said plates so that some of said plates are negatively charged and others are positively charged.

11. A method of manufacturing a lead storage battery comprising steps of cutting to a predetermined size unwoven fabric comprising mainly of lead fibers 150 to 200 $\mu\phi$ in diameter, pressing said unwoven fabric into a density of 5.0 to 5.5 g/cc, pressing the resulting electrode plate proper at least at the peripheral portion thereof into a density of not less than 10 g/cc more strongly than at any other portions of said electrode plate proper, welding a lead-out piece to a peripheral portion of said electrode plate proper, covering a synthetic resin film by injection molding over a weld zone between said peripheral portion and lead-out piece, immersing in an aqueous solution of $BaCl_2$ those of said electrode plates which are to become negative electrode plates, thereby to add barium sulfate to said electrode plates which are to become negative electrode plates, anodizing in an aqueous solution comprising a mixture of $NaClO_4$ and H_2SO_4 both of the electrode plates which are to become negative and positive electrode plates, washing in water and electrolytically reducing said two types of electrode plates in an aqueous solution of H_2SO_4, incorporating said two types of electrode plates in a container, and injecting into said container an electrolytic solution comprising a mixture of an aqueous solution of H_2SO_4 and lignin sulfonate thereby to perform an initial charging of said lead storage battery.

3,909,293
METHOD OF MANUFACTURING BATTERY PLATE GRIDS

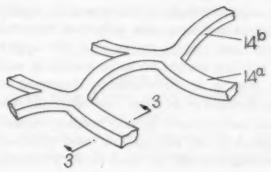
John Edward Hammond, and Alan Williams, both of Solihull, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Division of Ser. No. 246,796, April 24, 1972, abandoned. This application July 23, 1973, Ser. No. 381,586

Claims priority, application United Kingdom, Apr. 30, 1971, 12328/71; Apr. 29, 1971, 12301/71

Int. Cl. H01m *35/04*

U.S. Cl. 136—36 **7 Claims**



1. A method of manufacturing a battery plate grid of the kind including an open, rectangular conductive framework, a conductive battery plate lug integral with the framework, a plurality of parallel ribs extending between a pair of opposite frame members of the grid, and a plurality of strands arranged to define a lattice structure bounded by the framework, the interstices of the lattice structure in use receiving electrochemically active material, the method including the steps of:

a. blanking a strip of grid material to produce a preformed grid and having the same weight as the of finished grid having a rectangular framework substantially the same dimensions as that of the finished grid, the preformed grid also including a lattice structure defined by first and second sets of parallel strands and arranged so that the dimensions of the lattice structure in a direction perpendicular to the plane of the preformed grid are less than the corresponding dimensions of the lattice structure of the finished grid, and

b. displacing the strands of the preformed grid so as to impart relative movement to the first and second sets of strands respectively in a direction away from each other and perpendicular to the plane of the preformed grid, said dimensions of the lattice structure thereby being increased to the value required in the finished grid.

3,909,294
VIBRATION-PROOF BATTERY

Takashi Kosuge, and Ichiro Sano, both of Yokohama, Japan, assignors to Furukawa Denchi Kabushiki Kaisha, Yokohama, Japan

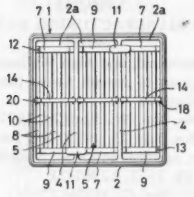
Filed Mar. 1, 1973, Ser. No. 337,276

Int. Cl. H01m *1/04*

U.S. Cl. 136—81 **3 Claims**

1. A vibration-proof battery comprising a battery casing having a bottom wall and upstanding side walls; a casing cover adapted to be supported along the upper edge surfaces of said

side walls; at least one electrode plate group having a plurality of vertically extending spaced electrode plates being positioned in said battery casing; and an electrode plate group holding means being positioned above and extending across said electrode plate group, said holding means having a plurality of comb teeth-shaped depending projections formed along its lower edge, each of said projections being in alignment and in contact with each end surface of the positive and negative electrodes of said electrode group, the upper edge surface of said holding means having upper projecting edges adapted to be engaged through adhesive agent in recesses of said casing



cover upon positioning of the latter upon said electrode plates and maintain said electrode plate group in rigidly fixed relationship within said casing, the adhesive means being interposed between said casing cover and the upper projecting edges of the holding means so as to maintain said cover and said holding means in permanently fastened relationship; groove means formed in at least two opposite inner side wall surfaces of said battery casing, said holding means having end portions adapted to be engaged in said groove means and forming a reinforcement for said battery casing; each said holding means extending across the center portion of each of said electrode plate group.

3,909,295

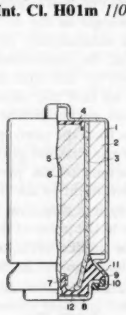
ALKALINE CELL

Takashi Tsychida, Kosai; Kenichi Shinoda, Toyohashi; Teruyoshi Yasuda, and Takaoki Takeshima, both of Kosai, all of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed May 17, 1974, Ser. No. 471,165

Int. Cl. H01m *1/00*

U.S. Cl. 136—83 R **5 Claims**



1. An alkaline cell comprising an anode active mass, a cathode active mass, an anode terminal member electrically connected to said anode active mass, a cathode terminal member electrically connected to said cathode active mass, and an insulator disposed between said terminal members and an acid layer on the inner surface of said anode terminal member within the path of an alkaline electrolyte which creeps by electrocapillary action, said acid layer containing acid reactive to said alkaline electrolyte to produce a salt.

3,909,296

SOLID ELECTROLYTE CELL

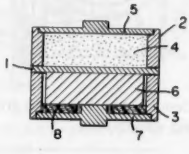
Yuzuru Ito, Sendai, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 19, 1974, Ser. No. 525,152

Claims priority, application Japan, Nov. 22, 1973, 48-135034

Int. Cl.² H01M *13/00*

U.S. Cl. 136—83 R **6 Claims**



1. A solid electrolyte cell comprising an anodic-active material, a cathodic-active material and a solid electrolyte, said cathodic-active material including compounds having a water of crystallization within the molecule and having disposed adjacent to said cathodic active material a hygroscopic substance capable of absorbing the water of crystallization liberated during the discharge of said cell.

3,909,297

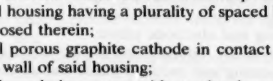
LITHIUM-CHLORINE BATTERY DESIGN

Edward J. Zeitner, Jr., Utica, Mich., and John H. Kennedy, Santa Barbara, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 10, 1968, Ser. No. 729,142

Int. Cl.² H01M *8/00*

U.S. Cl. 136—86 A **7 Claims**



1. A stackable lithium-chlorine fuel cell comprising:

a cylindrical housing having a plurality of spaced boundary walls disposed therein;

a cylindrical porous graphite cathode in contact with one boundary wall of said housing;

a cylindrical anode in contact with another boundary wall of said housing, said anode comprising a low density matrix of molten lithium-wettable metallic fibers having interspersed therein a charge of metallic lithium;

an insulating ring separating said cathode from said anode and forming therebetween a chamber suitable for containing a molten lithium chloride electrolyte;

means for feeding gaseous chlorine into said porous graphite cathode;

means for venting from said chamber lithium chloride reaction products formed by the cell reaction;

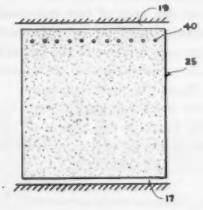
said one boundary wall and said other boundary wall positioned to contact the anode and cathode respectively of adjacent fuel cells.

3,909,298

BATTERIES COMPRISING VENTED ELECTRODES AND METHOD OF USING SAME

Peter Carr, Utica, Mich., assignor to Energy Development Associates, Madison Heights, Mich.

Continuation of Ser. No. 200,043, Nov. 18, 1971, abandoned.
This application July 16, 1973, Ser. No. 379,502
Int. Cl. H01m 29/02
U.S. Cl. 136—86 A 13 Claims



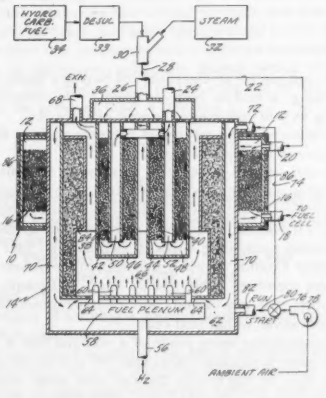
1. An apparatus for use in an electric energy storage device comprising a first member having a front and a back side, a second member having a front and a back side, a plurality of passageways formed by the attachment of the back sides of the first and second members, said members having a relatively low pressure differential there across, a venting means for passing undissolved halogen gas from the passageways and further providing that the front side of the first member is a positive electrode in one cell and the front side of the second member is a negative electrode of a second cell, the first member being porous and adapted to pass the electrolyte from the passageways through it and the second member being gas and electrolyte impervious; whereby any possibility of of gas locking after the porous electrode is flooded is effectively prevented; the porous member having a pore size ranging from about 10 to about 100 microns and the venting means being holes communicating with the passageways and ranging in diameter from about 0.5 to about 3 millimeters.

3,909,299

FUEL CELL SYSTEM INCLUDING REFORM REACTOR

Thomas J. Corrigan, Coventry, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 1, 1973, Ser. No. 402,226
Int. Cl.[2] H01M 27/12; B01J 7/00
U.S. Cl. 136—86 C 2 Claims



1. In a fuel cell power plant, a steam reform reactor/self-starting shift converter combination, comprising:

a reform reactor comprising a burner and a plurality of chambers, a first of said chambers being a reform reactor chamber having an inlet for receiving hydrocarbon fuel and containing steam reform reaction catalyst for converting the hydrocarbon fuel to hydrogen and other products and having an outlet, first duct means surrounding a substantial portion of said reform reactor chamber and in heat exchange relationship therewith, a second of said chambers containing said burner and providing for the flow of hot gases into said first duct means around said reform reactor chamber, said burner including an air plenum with a direct air inlet;

second duct means surrounding in heat exchange relationship a substantial portion of said first duct means and having an air inlet for receiving burner air and an air outlet opening into said air plenum of said burner;

a shift conversion chamber surrounding in heat exchange relationship substantial portions of said second duct means and said reform reactor and having an inlet for receiving the product of said reform reactor and an outlet for supplying processed hydrocarbon fuel including hydrogen to said fuel cell power plant; and

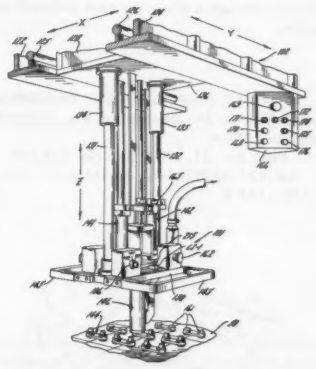
a source of ambient burner air including a valve and a pair of conduits, the first conduit of said pair connected to said air inlet of said second duct means and the second conduit of said pair connected to said direct air inlet of said burner air plenum, said valve being adapted to supply burner air to said second conduit during start-up and to said first conduit during running after start-up.

3,909,300

POSITIVE SEAL FOR BATTERIES EMPLOYING PLASTIC CASINGS

Raymond L. Schenk, Jr., Doylestown, Pa., and William B. Hayes, Cinnaminson, N.J., assignors to Gould Inc., St. Paul, Minn.

Filed Jan. 21, 1974, Ser. No. 435,166
Int. Cl. H01m 1/02
U.S. Cl. 136—134 R 9 Claims



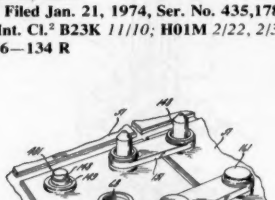
1. The method of assembling an improved industrial motive-power battery comprising the steps of:

a. positioning n (where n equals two or more) plastic battery cells in a battery casing with each cell having an assemblage of positive plates interleaved with an assemblage of negative plates and with adjacent plates of opposite polarity being spaced apart by separators, said positive plates connected to at least one upright positive post and said negative plates connected to at least one upright negative post;

b. forming a plastic battery cover having lead bushings molded therein for receiving respective different ones of said positive and negative posts and with said lead bush-

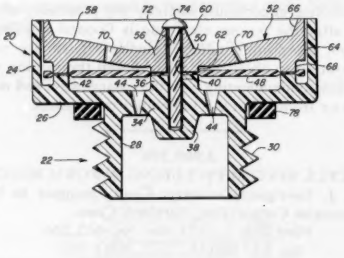
ings sealed with respect to said plastic battery cover by:
b-1 forming an annular groove in the outer surface of each lead bushing;
b-2 positioniong a continuous deformable seal element in each annular groove;
b-3 positioning the lead bushings and seals in a plastic injection mold; and
b-4 injecting plastic material into the mold under pressure so as to fill the mold and deform each of the seal elements into intimate sealing engagement between the molded plastic cover and the respective lead bushings;
c. removing the molded plastic cover from the mold and positioning it on the plastic battery cell with the positive and negative posts passing upwardly through respective different ones of the lead bushings;
d. positioning a lead intercell connector on each of said battery posts in coaxial surrounding relation thereto;
e. positioning a bonding head having a ram and a coaxial barrel over the battery with the ram disposed on a vertical axis coinciding with the axis of one of the battery posts;
f. moving the ram and barrel into engagement with the battery post and intercell connector, respectively;
g. heating the ram to a temperature sufficient to convert the lead components in the path of ram movement to the molten state;
h. moving the heated ram through the barrel and axially through the battery post and intercell connector and through the upper portion of the bushing with the ram following the post downwardly as the latter melts and displacing the molten lead thus formed upwardly into the barrel in surrounding relation with the ram;
i. retracting the ram from engagement with the unmelted lead components and the molten lead;
j. returning the molten lead theretofore displaced into the barrel back to the area of ram penetration into the battery post and intercell connector where such molten lead is permitted to cool and solidify;
k. retracting the barrel from the intercell connector upon cooling and solidification of the molten lead; and,
l. relocating the bonding head over each of the remaining battery posts in successive order and sequentially repeating steps f through k above for each different battery post position.

3,909,301
POSITIVE DISPLACEMENT BONDING
Raymond L. Schenk, Jr., Doylestown, Pa., assignor to Gould Inc., St. Paul, Minn.
Filed Jan. 21, 1974, Ser. No. 435,178
Int. Cl.[2] B23K *11/10*; **H01M** *2/22*, *2/30*
U.S. Cl. 136—134 R **33 Claims**



6. A method of bonding meltable material comprising the steps of:
a. moving a ram relative to the material so as to cause the ram to engage the material;
b. establishing a reservoir surrounding the ram and engaged with the material to be bonded;
c. introducing an inert gas into the reservoir for the purpose of entraining and removing oxidizing agents in the region of the material to be bonded;
d. heating the ram to a temperature sufficient to convert the meltable material in the path of relative ram movement to the molten state;
e. moving the heated ram relative to the material and through the reservoir so as to cause the ram to melt the material in its path of relative movement and in the environment of the inert gas to a desired depth in the material with the molten material thus formed being displaced by the ram from the area of ram penetration into the material and shifted therefrom into the reservoir;
f. retracting the ram relative to the material from its position of maximum penetration so as to cause the ram to be withdrawn from the material; and,
g. returning the molten material theretofore displaced into the reservoir back to the region of ram penetration into the meltable material where such molten material is permitted to cool and solidify.

3,909,302
VENT CAP FOR BATTERIES
Seymour Mermelstein, Newton, Mass., assignor to Tyco Laboratories, Inc., Waltham, Mass.
Filed June 21, 1973, Ser. No. 372,216
Int. Cl.[2] H01M *2/12*
U.S. Cl. 136—177 **11 Claims**



1. A vent cap for an electrical cell having a liquid electrolyte comprising: a hollow body adapted to be connected to an opening in said cell leading to said electrolyte;
a membrane disposed in and extending across the interior space of said hollow body;
first and second concentric membrane support members within and attached to said hollow body, said support members being spaced radially from one another; and
means frictionally securing said membrane to said first and second membrane support members so that the membrane extends between said support members, said support members being spaced apart sufficiently so that a substantial area of said membrane is exposed to gases and electrolyte within said cell;
said membrane being made of a material that is permeable to gases generated within said cell and serves as a barrier to flow of electrolyte through said body, said material comprising a microporous polytetrafluorethylene sheet with a pore size in the range of about **2** to about **10** microns.

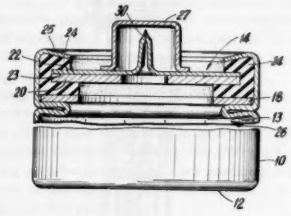
3,909,303
BATTERY CONSTRUCTION WITH PROVISION FOR VENTING ITS CONTENTS

Martin G. Rosansky, Monsey, and Ignatius Michalko, Ossing, both of N.Y., assignors to Power Conversion, Inc., Mount Vernon, N.Y.

Continuation of Ser. No. 327,937, Jan. 30, 1973. This application June 17, 1974, Ser. No. 480,245

Int. Cl.[2] H01M 2/12

U.S. Cl. 136—177 **4 Claims**



1. A sealed battery including provisions for preventing an explosion if the internal pressure exceeds a predetermined limit by permitting the battery contents to escape rapidly, said battery comprising:

a casing having an opening at one end thereof and defining a cavity for the electro-chemical contents of the battery; battery contents confined within said cavity including electrochemical means for generating an electrical current and capable of generating sufficient internal pressure to cause a violent explosion of said battery;

a rigid partition disposed across the opening in said casing and defining an aperture through which said battery contents can escape; and

cover means sealing said opening and covering said aperture for containing said battery contents under normal conditions and for rapidly releasing said battery contents if said predetermined pressure limit is reached, said cover means including a metal plate which is relatively soft and bendable in comparison to said partition and which overlies said partition, said plate being welded to said partition at, at least one predetermined confined a location spaced from its perimeter, said plate tearing where welded to permit the rapid release of the contents of the battery when the pressure limit is reached.

3,909,304
METHOD OF DOPING A SEMICONDUCTOR BODY

Kon Ho Cho, Lawrenceville, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed May 3, 1974, Ser. No. 466,920

Int. Cl.[2] H01L 21/265

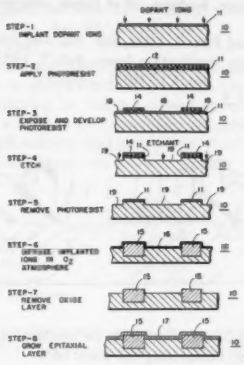
U.S. Cl. 148—1.5 **7 Claims**

1. A method of forming a doped region in a semiconductor body, which comprises:

implanting ions of dopant atoms into a surface of the semiconductor to form an implanted surface layer,

selectively coating said implanted surface with an etch-resistant pattern corresponding to the desired doped region, and

etching the uncoated portion of said coated surface to a depth where substantially all implanted ions are removed



to delineate the doped region, and to leave the resulting etched surface substantially free from defects.

3,909,305
ION IMPLANTATION PROCESS

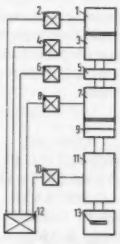
Hartmut Boroffka, Irschenhausen; Eberhard Krimmel, Pullach, and Hartmut Runge, Kirchseeon, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 7, 1973, Ser. No. 358,072

Claims priority, application Germany, May 9, 1972, 2222736

Int. Cl.[2] H01L 21/265

U.S. Cl. 148—1.5 **13 Claims**

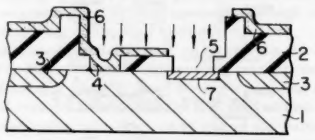


1. In a process for ion implantation with an ion implantation unit in which said unit comprises an ion source, an extraction element, a mass separator, a focussing device and an object holder, the improvement which comprises the steps of charging to said ion source a composition comprising chemical compounds which contains all the elements to be ionized which are required for the desired implantation, said composition being adapted to produce all required ion types in said ion source either simultaneously or sequentially, and directing said ions so produced from such ion source as a beam along one beam path towards a target object, the ions in said beam being controlled by said mass separator so that a particular type or types of ions desired are deflected onto said target object at a given prechose, desired instant of time at a predetermined energy and in a predetermined profile.

3,909,306
MIS TYPE SEMICONDUCTOR DEVICE HAVING HIGH OPERATING VOLTAGE AND MANUFACTURING METHOD

Takashi Sakamoto, Kodaira; Nobuhiro Tsuji, Kunitachi, and Hiroto Kawagoe, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 7, 1974, Ser. No. 440,356
Claims priority, application Japan, Feb. 7, 1973, 48-14670
Int. Cl.² H01L 21/265
U.S. Cl. 148—1.5 11 Claims

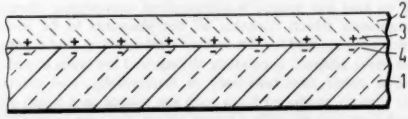


1. A method of manufacturing an insulated gate type field effect transistor, comprising the steps of:
a. forming a first insulating film on a semiconductor substrate;
b. forming, in said first insulating film, a first hole extending to the surface of the substrate;
c. introducing a conductivity type impurity determining which is different from that of the substrate, through said first hole into said substrate to form a first region of a relatively low impurity concentration;
d. forming a second insulating film in said hole;
e. forming, in said first and second insulating films, a second hole exposing a surface portion of said first region, and a third hole exposing a surface portion of said substrate, spaced apart from said first region;
f. introducing an impurity, determining the same conductivity type as that of said first region, through said second and third holes to form respective second and third regions having a relatively high impurity concentration;
g. removing part of the insulating films to expose a surface part of the substrate between said first and third regions and an edge part of the first region;
h. forming a third insulating film on the exposed surfaces of said substrate and said first region; and
i. forming an electrode on said third insulating film to extend over the edge of said first region but not extending over said second region.

3,909,307
PROCESS FOR COMPENSATING BOUNDARY CHARGES IN SILICON THIN LAYERS EPITAXIALLY GROWN ON A SUBSTRATE

Karl-Ulrich Stein, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 19, 1974, Ser. No. 498,476
Claims priority, application Germany, Sept. 3, 1973, 2344320
Int. Cl.² H01L 7/54, 7/36
U.S. Cl. 148—1.5 13 Claims

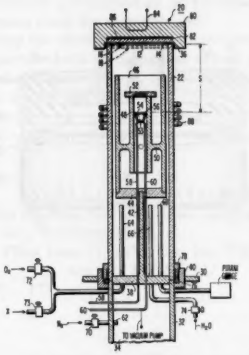


1. A process for compensating boundary charges in a semiconducting layer which is epitaxially grown on an insulating substrate which includes the step of introducing doping atoms into the region of the boundary charges.

3,909,308
PRODUCTION OF LEAD MONOXIDE COATED VIDICON TARGET

John Franklin Heagy, Leola, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,772
Int. Cl.² H01L 7/54
U.S. Cl. 148—1.5 17 Claims



1. A method of manufacturing a photosensitive device comprising the step of ionically bombarding a supported layer of lead monoxide, within an atmosphere containing at least one gas chemically inert with lead monoxide at a pressure of from about 4×10^{-2} to about 6×10^{-2} torr, by applying an electrical potential to said layer to effect electrical discharge through said atmosphere.

3,909,309
POST WORKING OF MECHANICALLY ALLOYED PRODUCTS

Michael James Bomford, Bublikon, Switzerland, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Sept. 11, 1973, Ser. No. 396,204
Int. Cl.² B22F 1/00, 3/14
U.S. Cl. 148—11.5 F 9 Claims

1. A process for achieving enhanced stress-rupture characteristics at elevated temperatures in respect of a mechanically alloyed superalloy composition containing as a dispersoid an oxide of a lanthanide series metal, whereby the alloy is capable of developing a desired structure having coarse elongated grains upon germinative grain growth treatment, which comprises hot consolidating a charge of such mechanically alloyed composite superalloy powder particles and thereafter hot working the resulting hot consolidated product, the temperature of hot working and amounts of reduction being correlated such that (a) the formation of small equiaxed grains upon grain coarsening heat treatment is minimized, and (b) the formation of coarse equiaxed grains and/or cracking of the consolidated product during the hot working operation is minimized, whereby coarse elongated grains result upon subsequent heating of the shape at germinative grain growth temperature.

3,909,310

APEX SEAL DESIGN

James C. Uy, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 391,409, Aug. 24, 1973. This application Sept. 5, 1974, Ser. No. 503,532
Int. Cl.² C21D 9/00; F04C 27/00
U.S. Cl. 148—11.5 R 4 Claims

1. A method of fabricating a seal structure for use in a rotary internal combustion engine, the method comprising:

a. preparing an admixture of metallic powders consisting of iron in the range of 40–65 percent titanium carbide in the range of 25–50 percent and about 10 percent of third elements selected from the group consisting of chromium and molybdenum,

b. compacting said admixture of iron, titanium carbide, and third element powders to define an elongated strip of material serving as a wear-resistant portion for said seal,

c. subjecting said compacted wear-resistant portion to a sintering operation,

d. subjecting said wear-resistant portion to an austenitizing treatment and interruptingly quenching said portion, first in warm oil and then in liquid nitrogen to develop a transverse rupture strength of about 350,000 p.s.i.,

e. preparing an admixture of powder particles consisting of aluminum in the range of 95–100 percent and copper in the range of 0–5 percent,

f. compacting said admixture of aluminum and copper powders for defining a supporting portion,

g. subjecting said compacted supporting portion to a sintering operation and

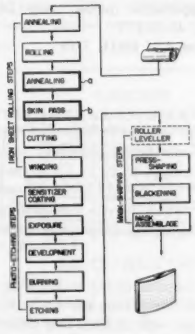
h. interlocking said portions together to complete said seal structure.

3,909,311

SHADOW MASK FOR USE IN COLOR PICTURE TUBE AND METHOD FOR FABRICATING SAME

Junichi Yamada; Etuzo Terashima, and Akira Takai, all of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 5, 1974, Ser. No. 494,905
Int. Cl.² C21D 9/46
U.S. Cl. 148—12.1 4 Claims



1. In a method of fabricating a shadow mask for use in a color picture tube comprising the processes of rolling, photoetching and mask-shaping; the improvement of said rolling process comprising a first annealing step for annealing a shadow mask material, a rolling step for rolling said annealed material into a desired thickness, a second annealing step for annealing said rolled material, and a skin-pass step for skin-passing said material after said second annealing step.

3,909,312

NON CORROSIVE FLUX FOR SOFT SOLDER

Michel Colombie, Saint-Etienne, France, assignor to Creusot-Loire, Paris, France

Continuation of Ser. No. 266,238, June 26, 1972, abandoned. This application Sept. 12, 1973, Ser. No. 396,364
Int. Cl.² B23K 35/34
U.S. Cl. 148—24 1 Claim

1. A non-corrosive soft solder flux particularly adapted for joining steels or alloys which may contain chromium by soldering or soldering or brazing consisting essentially of an emulsion of a mixture of ammonium phosphate, tin, nickel and copper phosphates and ammonium fluoride and having the following undiluted composition:

tin	6 to 7%
nickel	0.5 to 1.5%
copper	0.1 to 0.5%
ortho phosphoric acid (85% solution)	60 to 65%
ammonium fluoride	10 to 15%
ammonia 20/22° baume	15 to 20%

wherein said emulsion may contain free ammonia, free ortho phosphoric acid, free hydrofluoric acid, free tin, free nickel or free copper.

3,909,313

METHOD FOR FORMING AN ELECTRIC INSULATING FILM HAVING EXCELLENT PUNCHING PROPERTY AND HEAT RESISTANCE ON AN ELECTRICAL STEEL SHEET

Hirotada Kato, and Kazuo Nakamura, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Japan

Filed Sept. 21, 1973, Ser. No. 399,625
Claims priority, application Japan, Sept. 29, 1972, 47-97777
Int. Cl.² H01F 1/04
U.S. Cl. 148—113 5 Claims

1. A method for forming an insulating film having excellent punching and heat resistant properties on the surface of an electrical steel sheet comprising applying to an electrical sheet, a composition consisting essentially of chromic anhydride, a chromate of a bivalent metal or a bichromate of a bivalent metal; 1 to 10 parts per ten parts on a weight basis of a reducing agent selected from the group consisting of saturated dicarboxylic acids having 4 or more carbon atoms and polyethylene glycol; and 1 to 35 parts of an aqueous emulsion of a styrene resin containing at least 50% on a solids basis of styrene or an aqueous vinyl acetate emulsion prepared using a nonionic or mixture of a nonionic and anionic activating agent, the vinyl acetate emulsion being prepared in the absence of a high molecular weight protective colloid; and then baking the sheet at a temperature of 150° to 500° C.

3,909,314

METHOD FOR INDUCTIVELY HEATING AND QUENCH HARDENING SURFACES ON A CRANKSHAFT

Robert G. Armstrong, Chardon, and George C. Nebesar, Parma, both of Ohio, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio

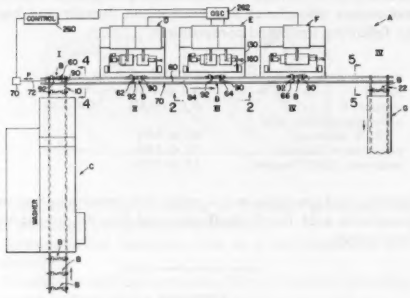
Division of Ser. No. 412,277, Nov. 2, 1973, Pat. No. 3,854,707. This application Sept. 19, 1974, Ser. No. 507,407
Int. Cl.² C21D 1/18
U.S. Cl. 148—146 1 Claim

1. A method for inductively heating and quench hardening bearing surfaces on a crankshaft having a central axis, said method comprising the steps of:

a. providing at a selected location a carriage pivoted about a carriage axis between first, second and third angular positions;

b. providing locating means on said carriage for selectively gripping or releasing a crankshaft;

c. moving a crankshaft axially along a longitudinal path generally parallel to said carriage axis to said selected location and at said first angular position;
d. pivoting said carriage into said first angular position;
e. gripping said crankshaft by said locating means on said carriage;
f. pivoting said carriage into said second angular position;
g. inductively heating at least one of said surfaces while said carriage is in said second angular position and while said crankshaft is rotated about its central axis;



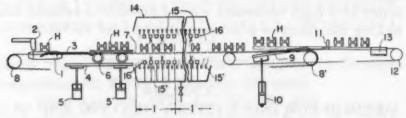
h. pivoting said carriage into said third angular position;
i. quench hardening said at least one surface while said carriage is in said third angular position and while said crankshaft is rotated about its central axis;
j. pivoting said carriage into said first angular position where said central axis is aligned with said path;
k. releasing said crankshaft from said locating means;
l. pivoting said carriage away from said first position; and, moving said crankshaft axially along said path from said selected location.

3,909,315

METHOD FOR RAPID COOLING OF HIGH TEMPERATURE METAL PIECES

Jinichi Akayama, Kitakyushu; Masanori Yokozeki, Kisarazu; Hideo Otsubo, Tokyo, and Sueta Igata, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 29, 1972, Ser. No. 319,710
Claims priority, application Japan, Dec. 29, 1971, 46-2929
Int. Cl. C21d *1/62*
U.S. Cl. 148—153 **2 Claims**



1. A method for rapidly cooling steel metal workpieces from a high temperature, which comprises:
arranging a plurality of elongated metal workpieces having substantially the same cross-sections parallel to one another in the direction of their widths, said cross-section of said workpieces being one of irregular and regular geometric, the separation between adjacent workpieces being as small as possible, but sufficient to isolate said workpieces from mutual influence of heat transmission to prevent bending of said workpieces;
continuously jetting over the entire surfaces of said workpieces a coolant at a higher flow rate per unit area of each said workpiece than the saturation rate at which a further increase thereof will not increase the cooling speed of said workpieces by means of nozzles equipped for this purpose;
transporting said workpieces intermittently for a prescribed distance in the direction of their width; and
jetting coolant to both the upper and the lower surfaces of said workpieces and also directly to the spaces between adjacent workpieces while at rest in order to have so produced vapor absorb heat radiation from the sides of said workpieces, said jetting to the intervening spaces being performed by selective nozzles, such selection being made according to the length of said workpieces, whereby cooling may be effected without warping and cracking of the workpieces.

3,909,316

METHOD FOR ANNEALING OF STRIP COILS

Hiromasa Hirata, Yokohama, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1973, Ser. No. 352,958
Int. Cl.² C21D *9/52*
U.S. Cl. 148—156 **1 Claim**

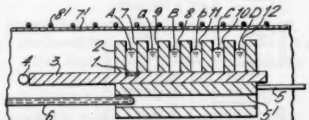
1. A method for continuously annealing steel strip coils comprising the steps of
a. uncoiling a strip coil,
b. heating the uncoiled strip to an elevated temperature of from 700°C to 720°C for a time period in the range of 20 to 30 seconds,
c. recoiling the heated strip,
d. maintaining the recoiled strip at substantially said elevated temperature for a time period in the range of 1.5 to 2 hours,
e. cooling the heated coil for a time period in the range of 4 hours,
f. uncoiling the cooled strip coil and rapidly cooling the strip, and
g. recoiling the rapidly cooled strip.

3,909,317

FORMATION OF ABRUPT JUNCTIONS IN LIQUID PHASE EPITAXY

Kunio Itoh, and Morio Inoue, both of Takatsuki, Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed July 30, 1973, Ser. No. 383,653
Claims priority, application Japan, July 28, 1972, 47-76176; July 28, 1972, 47-76177
Int. Cl.² H01L *7/38*
U.S. Cl. 148—171 **13 Claims**



1. In a method for manufacturing multiple layers by liquid phase epitaxial growth comprising the steps of contacting a semiconductor substrate with at least two different semiconductor solutions for subsequent epitaxial growth on said substrate, the improvement which comprises:
after forming an epitaxial growth layer on said substrate by contacting it with one of said solutions and prior to forming a subsequent epitaxial growth layer, another solution, which is substantially saturated with solute contained in said solution which has been contacted with said substrate and which dissolves the unnecessary component or components therein and removes them from the former layer, contacting said former epitaxial growth layer, wherein the temperature of said another solution is held

constant or raised slightly during the contacting with said another solution.

3,909,318

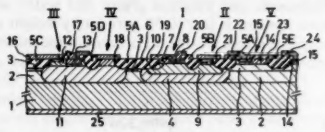
METHOD OF FORMING COMPLEMENTARY DEVICES UTILIZING OUTDIFFUSION AND SELECTIVE OXIDATION

Claude Jan Principe Frederic Le Can, Nijmegen; Else Kooi, Eindhoven, and Walter Steinmaier, Nijmegen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 237,460, March 23, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 399,860

Int. Cl.² H01L *21/76, 27/04*

U.S. Cl. 148—175 **10 Claims**



1. A method of manufacturing a semiconductor device comprising providing a monocrystalline semiconductor body having a region of a first conductivity type, forming a first buried layer of a second opposite conductivity type locally in said region of the first conductivity type, forming a second buried layer of the first conductivity type in such manner that it is fully surrounded by a part of the first buried layer and is in contact with said first buried layer, epitaxially depositing a semiconductor layer on and in contact with the region of the first conductivity type and the first and second buried layers, selectively oxidizing the epitaxial semiconductor layer over at least a part of its thickness to form an oxide pattern inset into the epitaxial semiconductor layer and into the second buried layer, the oxidation process being continued until the resulting oxide extends up to the part of the first buried layer surrounding the second buried layer but less than the full thickness of the second buried layer so as to form first and second island-shaped regions of the semiconductor layer that are interconnected by the underlying second buried layer but which are both isolated from the region of the first conductivity type by the first buried layer and the oxide pattern, and building zones of a semiconductor circuit element in at least the first island-shaped region.

3,909,319

PLANAR STRUCTURE SEMICONDUCTOR DEVICE AND METHOD OF MAKING THE SAME

Shohei Fujiwara, Takatsuki, and Susumu Koike, Fujiidera, both of Japan

Division of Ser. No. 226,613, Feb. 15, 1972, abandoned. This application July 25, 1973, Ser. No. 382,408

Claims priority, application Japan, Feb. 23, 1971, 46-8794; Feb. 23, 1971, 46-8795

Int. Cl.² H01I *7/44*

U.S. Cl. 148—187 **6 Claims**

1. A method of making a semiconductor device of planar structure comprising the steps of:

a. depositing a film of at least one refractory metal selected from the group consisting of tantalum, niobium, titanium, zirconium and hafnium on one main surface of an n-type III – V group compound semiconductor wafer to a thickness in the range of 500 to 3,000 A by sputtering;

b. adhering a resist film on a predetermined portion of said refractory metal film;

c. immersing the n-type semiconductor wafer in a reaction liquid consisting of oxalic acid, ethylene glycol and water to convert said refractory metal film into an oxide film of said refractory metal by means of anodization while leaving the portion directly beneath the resist film not converted;

d. removing said resist film through chemical etching: and

e. heating the n-type semiconductor wafer in a sealed tube in the presence of a p-type predetermined impurity selected from the group consisting of zinc and cadmium to diffuse said impurity through said refractory metal film to form a p-type region of high concentration of said impurity directly beneath said refractory metal film.

3,909,320

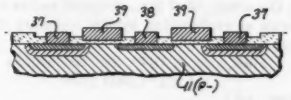
METHOD FOR FORMING MOS STRUCTURE USING DOUBLE DIFFUSION

Thomas P. Gauge, San Jose; Joseph Kocsis, Saratoga, and James R. Buchanan, Sunnyvale, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Dec. 26, 1973 (Under Rule 47a), Ser. No. 428,328

Int. Cl.² H01L *21/223*

U.S. Cl. 148—187 **17 Claims**



1. In a method for forming an MOS structure, providing a semiconductor body of silicon having an impurity of one conductivity type and having a generally planar surface, forming a gate layer of silicon dioxide of relatively precise thickness on said surface, providing a protective structure on said gate layer, forming an opening in said protective structure adjacent said gate layer and exposing said surface, causing first and second impurities to pass through said opening utilizing the edge of said protective structure as a mask to provide first and second regions of different conductivity types in said semiconductor body and to provide a channel of precise length underlying the gate layer, removing the protective structure from the gate layer after formation of the first and second regions, and forming gate, source and drain contact metallization.

3,909,321

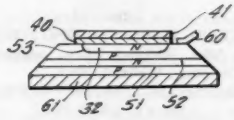
CONTROL OF DIFFUSION PROFILES IN A THYRISTOR BY A GROWN OXIDE LAYER

Gary I. Roberts, Mountain View, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Nov. 5, 1973, Ser. No. 413,044

Int. Cl.² H01L *7/44*

U.S. Cl. 148—190 **6 Claims**



1. The process of forming a plurality of spaced P-N junctions in a monocrystalline silicon wafer; said process comprising the steps of:

forming a diffusion mask on the outer surface of said silicon wafer,

forming at least one window in said diffusion mask,

loading said wafer into a diffusion furnace and loading a measured mass of a Group III-V intermetallic compound and a measured mass of a pure metal selected from the group consisting of Group III and Group V metals into said diffusion furnace,

heating said diffusion furnace to a diffusion temperature and forming, in a single diffusion cycle, a P-type region in said wafer beneath said diffusion mask and an N-type region in regions of said wafer exposed to said mask with the junction between said P-type and N-type regions extending to and terminating on said outer surface of said wafer,

and thereafter stripping and redepositing an oxide coating over the entire wafer, and raising the temperature of said wafer, thereby to vary the impurity concentration of both Group III and V impurities within the wafer.

3,909,322

SOLID GAS GENERATING AND GUN PROPELLANT COMPOSITIONS CONTAINING A NITROAMINOTETRAZOLE SALT

Marguerite S. Chang, Forest Heights; Charles L. Whitman, LaPlata; Hermann S. Haiss, Indian Head, and John H. Highby, Oxon Hill, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 3, 1970, Ser. No. 64,154
Int. Cl.² C06D *5/06*
U.S. Cl. 149—19.4 **6 Claims**

1. A solid propellant composition comprising an oxidant, a nitroaminotetrazole salt selected from the group consisting of guanidinium 5-nitroaminotetrazole, ammonium 5-nitroaminotetrazole and hydrazinium 5-nitroaminotetrazole and a compatible binder.

3,909,323

COOL BURNING GUN PROPELLANTS CONTAINING TRIAMINOGUANIDINE NITRATE AND CYCLOTETRAMETHYLENE TETRANITRAMINE WITH ETHYL CELLULOSE BINDER

Joseph E. Flanagan, Woodland Hills, and Vernon E. Haury, Santa Susana, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed June 14, 1973, Ser. No. 370,117
Int. Cl.² C06B *25/06*
U.S. Cl. 149—19.7 **7 Claims**

1. A gun propellant containing triaminoguanidine nitrate and cyclotetramethylene tetranitramine with a binder of ethyl cellulose.

3,909,324

PYROTECHNIC DISSEMINATING FORMULATION

Earl Thomas Niles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 21, 1966, Ser. No. 596,009
Int. Cl.² G06B *29/22*
U.S. Cl. 149—76 **6 Claims**

1. A pyrotechnic disseminating formulation comprising

a. from about 8 to about 40 weight percent of a fuel member selected from the group consisting of aminoguanidinium nitrates and aminoguanidinium nitrate condensation products,

b. from about 8 to about 30 weight percent of a member selected from the group consisting of alkali metal or ammonium chlorates and perchlorates as oxidizer, and

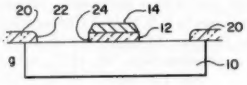
c. balance an effective amount of an agent selected from the group consisting of chemical warfare agents, incapacitating agents, smoke dyes and plant growth regulants to be disseminated.

3,909,325

POLYCRYSTALLINE ETCH

Clyde L. Church, Tempe, Ariz., and James W. Smith, II, Santa Ana, Calif., assignors to Motorola, Inc., Chicago, Ill.

Filed June 28, 1974, Ser. No. 484,375
Int. Cl.² H01L *7/50*
U.S. Cl. 156—17 **6 Claims**



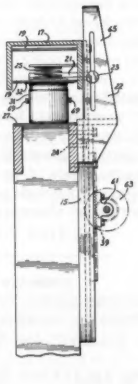
1. An etchant for polycrystalline silicon comprising potassium hydroxide and ethylene glycol and water wherein the potassium hydroxide is 8 to 50 percent by weight of the mixture, ethylene glycol is 10 to 92 percent of the mixture and the water comprises 0–45 percent of the mixture.

3,909,326

METHOD FOR APPLYING HEAT SEALABLE MEMBRANE

Lawrence E. Renck, Rolling Meadows, Ill., assignor to Kraftco Corporation, Glenview, Ill.

Filed Feb. 26, 1973, Ser. No. 335,947
Int. Cl.² B29C *27/04*
U.S. Cl. 156—69 **6 Claims**



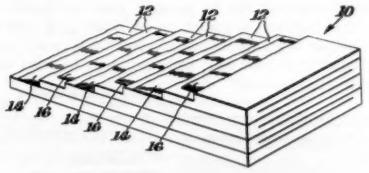
1. A continuous method for applying and sealing a heat sealable packaging material to the mouth of a container consisting essentially of the steps of continuously transporting an open mouth container along a conveyor, placing a heat sealable packaging material in contact with said mouth of said container, engaging said heat sealable packaging material with a moving surface spaced from said conveyor, moving parallel to said conveyor in the same direction and at the same speed as said conveyor so as to press said packaging material against said mouth of said container with sufficient pressure to seal said packaging material to said mouth of said container when said container with said packaging material in contact with said mouth is continuously passed in proximity to induction heating means.

3,909,327

METHOD FOR MAKING A MONOLITHIC CERAMIC CAPACITOR WITH SILVER BEARING ELECTRODES

Maggio P. Pechini, c/o Vincent H. Sweeney, Sprague Electric Company, North Adams, Mass. 01247

Filed Aug. 5 (Under Rule 47), 1974, Ser. No. 494,690
Int. Cl.² B44D *1/18*
U.S. Cl. 156—89 **7 Claims**



1. A method for making a monolithic ceramic capacitor having silver bearing electrodes comprising:
   a. depositing on plates of a green ceramic material a film of conductive electroding paste, said paste comprising particles that are by weight 50–80% metal and 50–20% ceramic material, said metal being selected from the group consisting of palladium, silver, and alloys and mixtures thereof;
   b. stacking said plates; and
   c. firing said stack in an atmosphere containing silver vapor at a sufficiently high temperature to sinter said ceramic materials and to melt said electroding metal.

3,909,328

DECORATION OF SUBSTRATES BY THERMAL TRANSFER OF PHOTOSENSITIVE, THERMOPLASTIC, DYE-IMAGED FILM

Rolf Dessauer, Greenville, and Catharine Elizabeth Looney, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 10, 1973, Ser. No. 349,702
Int. Cl.² B31F
U.S. Cl. 156—219 **1 Claim**

1. A decorative process comprising
   1. photoimaging with activating light a composite consisting essentially of a film coated onto a carrier support, the film comprising a first photosensitive dye-forming composition in a film-forming thermoplastic binder;
   2. impregnating the film with a second photosensitive dye-forming system which is compatible with the first dye-forming system;
   3. fixing the photoimage resulting from step (1) prior to photoimaging the second dye-forming system;
   4. photoimaaging with activating light the coated film impregnated with the second photosensitive dye-forming system;
   5. heating the film to a temperature of between 40 and 220°C. at which its outer surface is adhesive and contacting the outer film surface with a receiving support more adherent to the film than the carrier support; and
   6. separating the two supports, whereby the photo-imaged film adheres to and is transferred to the receiving support and is released from the carrier support.

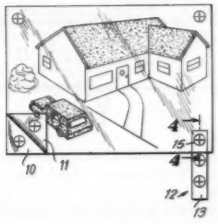
3,909,329

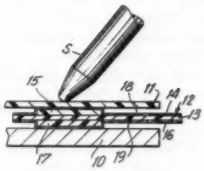
ARTICLE FOR APPLYING REGISTER OR INDEX MARKS AND METHOD OF USING THE SAME

Benjamin Edward Smolen, 155 E. 55th St., New York, N.Y. 10022

Filed Nov. 19, 1974, Ser. No. 525,074
Int. Cl.² B32B *3/16*; B41M *3/12*; B44C *1/16*
U.S. Cl. 156—234 **5 Claims**

1. An article for applying index marks in precise alignment on a superimposed pair of receiver sheets comprising, in combination, a carrier sheet, the opposed surfaces of which have high release properties, a first index mark on the front face of said sheet, a second index mark on the rear face of said sheet, said first and second index marks being disposed in precise coordinated position with each other and being comprised of coherent, solid, opaque films releasably bonded to said sheet, and pellucid adhesive layers on said front and rear surfaces, said layers covering at least said index marks and areas of said surfaces surrounding said marks, said adhesive being of the type having an initial low tack which is rendered highly adherent responsive to localized high pressure, the bond between said adhesive and said index marks being substantially greater than the bond between said marks and said carrier sheet, whereby when said article is disposed between two superimposed receiver sheets and the area of said sheets in registry





with said index marks of said article is subjected to localized pressures, said index marks are transferred from said carrier sheet to the facing surfaces of said receiver sheets.

4. The method of applying to each of two superimposed sheets, at least one of which is pellucid, an index mark, said marks being disposed in precise registry, comprising the steps of interposing between said superimposed sheets a transfer sheet having on the opposed surfaces thereof pressure releasable index marks, said marks on said transfer sheet being in precise registration, and thereafter subjecting said superimposed sheets, with said transfer sheets therebetween, to localize pressures, thereby to cause said index marks to be released from said carrier and adhesively connected to said superimposed sheets in the same relative positional relationship which they occupied on said transfer sheet.

3,909,330

METHOD OF, AND DEVICE FOR, PROVIDING A WEB OF PACKAGING MATERIAL WITH A TEAR STRIP

Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Filed Nov. 1, 1973, Ser. No. 411,876
Claims priority, application United Kingdom, Nov. 17, 1972, 53143/72
Int. Cl.² B32B *31/00*; B31D *1/00*; B32D *25/08*
U.S. Cl. 156—252 **11 Claims**

1. A method of providing a web of packaging material with a tear strip, comprising, in combination, the steps of:
   feeding said web of packaging material along a feed path;
   perforating said web in a zone extending substantially parallel to the longitudinal edges thereof;
   cutting a strip from a web of tear-strip material;
   applying said cut strip to one surface of said web of packaging material to overlie said zone of perforation;
   applying suction to the respective opposite surface of said web of packaging material to transmit said suction

through said zone of perforation and thereby to retain said cut strip against said one surface; and

bonding said cut strip to said web of packaging material.

4. A device for providing a web of packaging material with a tear-strip, comprising, in combination:

feeder means to feed said web of packaging material along a feed path;

perforator means to perforate said web of packaging material in a zone substantially parallel to the longitudinal axis thereof;

cutting means to cut a strip from a web of tear-strip material;

applying means to apply said cut strip to one surface of said web of packaging material thereby to cause said cut strip to overlie said zone of perforation;

means for applying suction to the respective other surface of said web of packaging material to transmit said suction through said zone of perforation and therby to retain said cut strip against said one surface; and

bonding means to bond said cut strip to said web of packaging material.

3,909,331

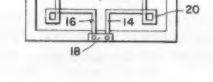
METHOD OF WINDOW FOILING PRECUT GEOMETRIC PATTERNS IN A BURGLAR ALARM SYSTEM

Morton Cohen, 4127 Westmoreland St., Little Neck, N.Y. 11363

Filed Jan. 4, 1974, Ser. No. 430,705

Int. Cl.[2] B32B *31/10, 31/18, 7/06;* **G08B** *13/04*

U.S. Cl. 156—253 **5 Claims**



1. A method for window foiling a pre-determined pattern in a burglar alarm system with the pre-determined pattern having at least one corner, said method comprising the steps of:

a. foiling the window with straight line segments of electrically conductive foil to thereby form part of the pre-determined pattern;

b. applying pre-cut, geometrically shaped metallic foil patterns to the window in at least partially overlapping relationship with the straight line segments to thereby complete the pre-determined pattern; and

c. electrically coupling the portion of the straight line segments and the pre-cut patterns that are overlapped so that the complete, pre-determined pattern may be connected to the burglar alarm system.

3,909,332

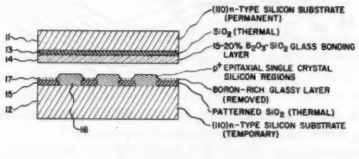
BONDING PROCESS FOR DIELECTRIC ISOLATION OF SINGLE CRYSTAL SEMICONDUCTOR STRUCTURES

Alexander J. Yerman, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 4, 1973, Ser. No. 366,380

Int. Cl.[2] C09J *5/00;* **C03C** *27/00;* **B32B** *17/06*

U.S. Cl. 156—309 **3 Claims**



1. A bonding process for dielectrically isolated single crystal silicon structures comprising the steps of

providing first and second single crystal silicon structures, forming a silicon dioxide insulating layer on at least one of said silicon structures,

chemically depositing on at least one of said silicon structures as so prepared a glass bonding layer consisting essentially in mole percent of 15–20 percent boric oxide and 80–85 percent silicon dioxide and having a thermal expansion coefficient that approximately matches the thermal expansion coefficient of silicon, and

bonding together said single crystal silicon structures with at least one intermediate silicon dioxide layer and glass bonding layer at a temperature not exceeding about 900°C and at least as high as the softening temperature of said glass bonding layer under a controlled pressure of several hundred psi and for a time interval of about one-half hour to 1 hour to thereby cause flow of said glass bonding layer under the controlled pressure.

3,909,333

MELT-STABILIZED SEGMENTED COPOLYESTER ADHESIVE

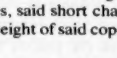
Ernest Francis Eastman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 370,543, June 15, 1973. This application May 15, 1974, Ser. No. 470,266

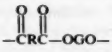
Int. Cl.[2] C09J *3/16*

U.S. Cl. 156—331 **75 Claims**

1. A thermally stabilized thermoplastic segmented copolyester elastomer consisting essentially of a multiplicity of recurring short chain ester units and long chain ester units joined through ester linkages, said short chain ester units amount to 15 to 75 percent by weight of said copolyester and being of the formula

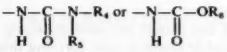


and said long chain ester units amounting to 25 to 85 percent by weight of said copolyester and being of the formula



wherein R is the divalent radical remaining after removal of the carboxyl groups from dicarboxylic acid having a molecular weight of less than 350 D is the divalent radical remaining after removal of the hydroxyl groups from organic diol having a molecular weight of less than 250, and G is the divalent radical remaining after removal of the terminal hydroxyl groups from long chain glycol having an average molecular weight of 350 to 6000, said copolyester having a melt index of less than 150 and a melting point of at least 90°C., stabilized with 1.75 to 15.0 percent by weight, based on the weight of elastomer, of a stabilizer mixture comprising

a. 0.25 to 2.5 percent by weight of a substantially linear polycarbodiimide having an average of at least two carbodiimide groups per molecule of the formula $X_1—R_1[N=C=N—R_2]_n N=C=N—R_3—X_2$ where R_1, R_2 and R_3 are C_1–C_{12} aliphatic, C_5–C_{15} cycloaliphatic, or C_6–C_{15} aromatic divalent hydrocarbon radicals, and combinations thereof; X_1 and X_2 are hydrogen,



where R_4, R_5 and R_6 are C_1–C_{12} aliphatic, C_5–C_{15} cycloaliphatic, and C_6–C_{15} aromatic monovalent hydrocarbon radicals and combinations thereof, and additionally R_4 or R_5 can be hydrogen; and n is a number of at least one;

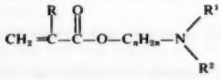
and at least two compounds taken from the group consisting of

b. 0.5 to 2.5 percent by weight of a compound taken from the group consisting of hindered phenols, nitrogen-containing hindered phenols, phosphorus-containing hindered phenols and secondary aromatic amines;

c. 0.5 to 5.0 percent by weight phosphorus acid esters of the formula

where R_1, R_2 and R_3 are C_1 to C_{18} aliphatic, C_6 to C_{15} aromatic, and combinations thereof; and

d. 0.5 to 5.0 percent by weight of an amino compound taken from the group consisting of a homopolymer of an amino acrylate of the formula



where

R is hydrogen or methyl,

R^1 is hydrogen or alkyl of 1 to 4 carbon atoms,

R^2 is alkyl of 1 to 4 carbon atoms,

n is an integer of 1 to 4 inclusive, and a random copolymer of ethylene and 20 to 40 percent by weight of said amino acrylate compound, each of compounds (b), (c) and (d) being compatible with each other and with (a).

3,909,334

PACKAGING MACHINE

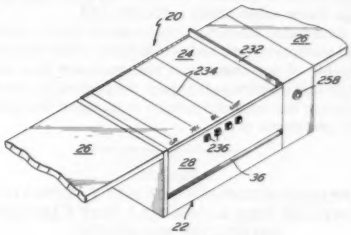
Henry Verbeke, Tannersbrook Rd., Chester, N.J. 07930

Filed Feb. 25, 1974, Ser. No. 445,731

Int. Cl.² G01B *5/00;* **B26D** *5/20;* **B65B** *5/00*

U.S. Cl. 156—378 **1 Claim**

1. A bag forming device for forming an individual bag adapted to package an item of merchandise, said device comprising a housing, means for supporting a roll of tubular plastic film within said housing, feed means for removing a predetermined length of plastic film from said roll, stop means on said housing, with the items to be packaged in said plastic bag being adapted to have one end positioned against said stop means, indicia on said housing, said indicia indicating various lengths of bags to be produced by said device, switch means associated with each of said indicia, whereby one of said



switch means may be closed to cause the production of a bag of said predetermined length, with each of said switch means producing a bag of different length, said feed means comprising a pair of draw rollers, with said tubular plastic film passing between said rollers, sealing means for placing a heat seal across the width of said tubular plastic film and a cutting blade for severing said predetermined length of said plastic film from the remainder of said plastic bag adjacent said heat seal, whereby said severed portion comprises an open plastic bag.

3,909,335

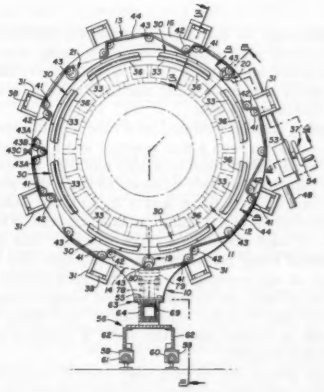
PNEUMATIC TIRE TRANSPORTER

Frank R. Jellison, Canton, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed May 22, 1974, Ser. No. 472,270

Int. Cl.² B29H *17/14, 17/26, 17/36*

U.S. Cl. 156—396 **8 Claims**



1. A pneumatic tire transporter for dismounting and transporting at least a portion of a pneumatic tire from a collapsible tire building drum comprising:

A. a transport cage frame capable of being positioned circumferentially about a portion of a pneumatic tire assembled on a collapsible tire building drum;

B. a plurality of support pads spaced about and slidably supported on said cage frame and capable of moving radially inwardly to engage the portion of the pneumatic

tire assembled on the collapsible tire building drum at least adjacent opposite axial end portions of the building drum;

C. a transport base member for supporting said cage frame and moving said frame with at least a portion of a pneumatic tire engaged therein horizontally to dismount said portion of a pneumatic tire from the collapsible tire building drum;

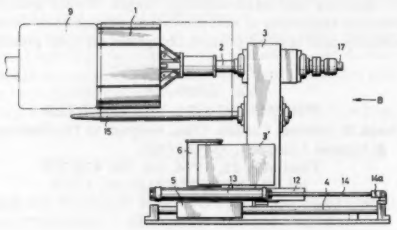
D. drive means for rotating at least a portion of the transport frame to position the central axis of the transport cage frame substantially vertically; and

E. a detachable assembly comprising at least a portion of said transport frame and at least some of the support pads capable of detaching from said transport base member while said support pads engage the pneumatic tire at least adjacent one axial end portion to transport the portion of one pneumatic tire.

3,909,336
APPARATUS FOR SUCCESSIVELY SUPPLYING ENDLESS TIRE BANDS TO A TIRE CARCASS PRODUCING EQUIPMENT

Shoji Takahashi, and Toshinori Yabe, both of Kodaira, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Apr. 19, 1973, Ser. No. 352,553
Int. Cl.[2] B29H *17/02, 17/10, 17/37*
U.S. Cl. 156—405 **4 Claims**



1. Apparatus for successively supplying endless tire bands from a supply station thereof onto a forming drum in a tire carcass producing equipment adapted to receive therearound said endless tire band upon rotation thereof, wherein the improvement comprises:

a holding column mounted on a base of said apparatus and movable between a first position and a second position; an expandable drum rotatably mounted on said holding column and movable between an expanded position and a contracted position and a feeding bar also rotatably mounted on said holding column adjacent to the periphery of said expandable drum with the axis of rotation thereof being oriented at a small angle with respect to that of said expandable drum for cooperation therewith so as to move an endless tire band supported around said drum and said bar axially out of said drum when said drum is rotated while the same is brought to said expanded position.

driving means for moving said column reciprocably between said first position and said second position, said expandable drum being so positioned on said column that the same is contracted with said forming drum in alignment therewith so as to be rotated thereby when said column is brought to said first position while said expandable drum is brought to said supply station when said column is brought to said second position;

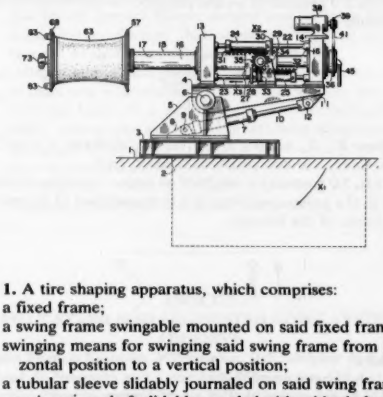
actuating means for moving said expandable drum between said expanded position and said contracted position, and control means for operating said driving means and said actuating means in such timed relationship therebetween that said expandable drum is brought to said contracted position when said column is brought to said second position thereby permitting said drum and said feeding bar to receive therearound an endless tire band from said supply station due to the fact that the effective diameter of said drum and said feeding bar is less than the diameter of said tire band while said expandable drum is brought to said expanded position when said column is brought to said first position so as to contact said expandable drum with said forming drum for rotation therewith thereby permitting said endless tire band supported around said drum and said feeding bar to be supplied therefrom onto said forming drum due to the fact that the effective diameter of said drum and said feeding bar is slightly greater than the diameter of said forming drum, the axis of said feeding bar is oriented at a small angle with respect to that of the expandable drum so as to generate an axial component of force which is applied to the endless tire band for driving the same axially toward the forming drum while the endless tire band is rotating around the expandable drum and the feeding bar, and the tip of said feeding bar terminates at a position slightly axially inwardly of that end of said forming drum which is adjacent said feeding bar,

whereby said tire bands are automatically supplied from said expandable drum to said forming drum.

3,909,337
GREEN TIRE SHAPING APPARATUS

Toshinori Yabe, Kodaira, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 25, 1973, Ser. No. 364,131
Claims priority, application Japan, May 31, 1972, 47-54066
Int. Cl.[2] B29H *17/02, 17/16, 17/37*
U.S. Cl. 156—416 **5 Claims**



1. A tire shaping apparatus, which comprises:

a fixed frame;

a swing frame swingable mounted on said fixed frame;

swinging means for swinging said swing frame from a horizontal position to a vertical position;

a tubular sleeve slidably journaled on said swing frame;

a main rotary shaft slidably coupled with said tubular sleeve and having therein a pressurized fluid conduit extending in the axial direction of the shaft and opened at one end; actuating means for sliding said sleeve and rotary shaft relative to each other;

rotating means for rotating said sleeve and rotary shaft; and

a tire shaping drum including an upper bead ring assembly detachably mounted on said one end of said main rotary shaft and having an annular member with a circumferentially extending groove in one side wall thereof, a lower bead ring assembly detachably mounted on one end of said sleeve and having an annular member with a circumferentially extending projection on one side all thereof facing said upper bead ring assembly so as to be hermetically coupled with said groove, an elastic tubular member with opened ends hermetically sealed with said

upper and lower bead ring assemblies so as to be capable of forming a sealed chamber by hermetically coupling said projection of said lower bead ring assembly and said groove of said upper bead ring assembly, said elastic tubular member being in communication with said conduit so that said elastic tubular member is inflated when pressurized fluid is delivered through said conduit, lock means for coupling said annular members of said upper and lower bead ring assemblies to maintain the coupling between the groove and projections thereof, and lock control means for controlling said lock means to couple and decouple said annular members of said upper and lower bead ring assemblies from said outside said upper bead ring assembly.

3,909,338
APPARATUS FOR APPLYING AN APEX STRIP TO A BEAD RING

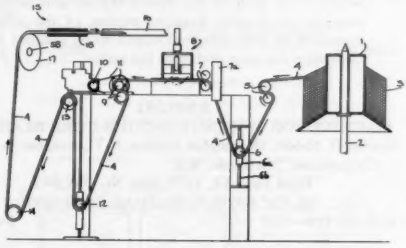
Jean R. Leblond, and Jacques P. Verhulst, both of Compiegne, France, assignors to Uniroyal (France), Clairoix, France

Filed Nov. 1, 1973, Ser. No. 411,966

Claims priority, application France, Nov. 22, 1972, 72.41476

Int. Cl.[2] B29H *17/10, 17/32*

U.S. Cl. 156—422 **33 Claims**



1. In apparatus for applying a tacky elastomeric strip to an outer periphery of a bead ring for a pneumatic tire, said apparatus including:

a. carrier means for detachably supporting a bead ring such that the outer periphery of said bead ring remains exposed;

b. strip-feed means for advancing an elastomeric strip lengthwise to said bead ring;

c. strip-application means for applying and effecting adhesion of a leading end of said strip to the outer periphery of said bead ring;

d. drive means for rotating said carrier means and, thereby, said bead ring and said leading end of said strip relative to said strip-application means;

e. strip-cutting means for severing a portion of said strip trailing said leading end from the remainder of said strip at a length corresponding to the circumference of the outer periphery of said bead ring; and

f. strip-pressing means for pressing and effecting adhesion of the severed portion of said strip against the outer periphery of said bead ring during rotation of the latter, said drive means including an improvement comprising indexing means for rotating said carrier means intermittently in the course of a single revolution, whereby rotation of said carrier means is halted at selected intervals for operative association with said strip-pressing means and said strip-cutting means,

said indexing means including a plurality of series-connected, independently actuable, power cylinders corresponding in number to the number of times rotation of said carrier means is halted in the course of at least one revolution for permitting severing and applying said strip to said bead ring, each of said cylinders having a stroke corresponding to the respective angular displacement of said carrier means it is to effect.

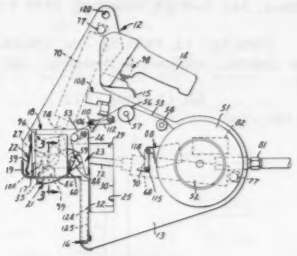
3,909,339
TAPE APPLYING DEVICE

John T. Verch, Hastings, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 9, 1974, Ser. No. 432,061

Int. Cl.[2] B32B *31/00;* **B31B** *1/72*

U.S. Cl. 156—477 R **9 Claims**



1. A device adapted for applying predetermined lengths of pressure sensitive adhesive tape to a substrate from a supply of pressure sensitive adhesive tape, comprising:

a tape applying head having first and second adjacent angularly disposed peripheral surface portions each adapted for contacting the nonadhesive surface of said tape;

means adapted for guiding a said supply of adhesive tape across said first peripheral surface portion from the end thereof opposite said second peripheral surface portion;

tape engagement means adapted for engaging the edges of a said tape to releasably support the tape in a direction normal to its surfaces while affording relatively free longitudinal movement thereof;

means mounting the tape engagement means on the tape applying head for movement between an engage position at the edges of said first peripheral surface portion to engage tape therealong, and a release position with said tape engagement means displaced from the engage position and out of engagement with tape along said first peripheral surface portion, said means mounting the tape engagement means being adapted to be moved to said release position by contact with a said substrate moved into contact with tape along said first peripheral surface portion;

means for positioning said tape applying head in a predetermined starting position relative to a said substrate with the first peripheral surface portion forcefully pressing an end part of a said tape thereon against a said substrate, thereby moving said means mounting the tape engagement means to said release position and adhering the tape end part to the substrate;

means adapted for providing relative sliding movement between said tape applying head and said adhesive tape with the head forcefully urging said length of tape being applied against said substrate from said starting position to a finish position, and for positioning the second peripheral surface portion adjacent the substrate at the finish position;

means for tensioning the tape supply along said first peripheral surface portion during said relative sliding movement between the starting and finish positions;

means for biasing said means mounting the tape engagement means to said engage position with sufficient force to move said tape engagement means over a tape tensioned along said first peripheral surface portion; said means mounting said tape engagement means being shaped to afford movement to said engage position under

the influence of said biasing means at said finish position; and

means adapted for severing a said supply of adhesive tape between said first and second peripheral surface portions at said finish position.

3,909,340

APPARATUS FOR MANUFACTURING A SHEET MATERIAL COMPRISING A CONTINUOUS WEB OF A THERMOPLASTICS MATERIAL WITH LOCALLY SECURED FASTENER ELEMENTS

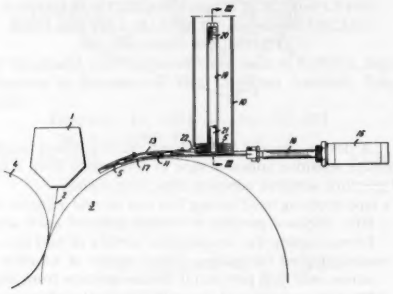
Erik Sølbeck, 342 Vedbaek Strandvej, 2950 Vedbaek, Denmark

Filed Apr. 12, 1973, Ser. No. 350,663

Claims priority, application Denmark, Apr. 19, 1972, 1915/72

Int. Cl. B29c *27/12*

U.S. Cl. 156—500 **12 Claims**



1. Apparatus for manufacturing a sheet material for use as tarpaulins, tent-cloth and the like and comprising a continuous web of a thermoplastic material with locally secured fastener elements, said apparatus comprising

an extruder head having an elongated generally downwardly oriented nozzle orifice,

a pair of rollers mounted generally below said nozzle orifice and laterally spaced so as to form between them a nip for calibrating a film extruded through said nozzle orifice, and means for continuously rotating said rollers in opposite directions, and

a feeding device mounted above one of said rollers and comprising a magazine for containing a supply of fastener elements, said magazine being laterally spaced from said extruder head,

wall means defining a discharge passage extending from said magazine towards said roller nip,

an exit opening in said magazine connecting the magazine with the passage,

a slide extending into said discharge passage and having at least one pusher member for withdrawing one fastener element at a time from said magazine and pushing it into the discharge passage,

and drive means for effecting an intermittent reciprocating lengthwise movement of said slide in timed relationship with the peripheral speed of said one roller.

3,909,341

SPLICING TOOL

Peter A. Moscovita, Narragansett, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 12, 1973, Ser. No. 423,962

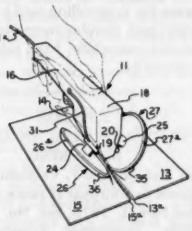
Int. Cl.² B65H *69/06*

U.S. Cl. 156—502 **11 Claims**

1. A tool for splicing together abutting marginal edges of heat-softenable material desirably joined, secured or bonded together, said tool comprising:

a. a handle, including a hand-hold end and a head end,

b. a pair of wheels rotatably mounted dependingly in said head end, said wheels being equally oppositely inclined to define an included angle of 60° to 120 °, said wheels each having an outer peripheral surface adapted to contact the margins of said material, thereby urging said edges together as said handle is manipulated to roll said inclined wheels along said margins on either side of said line,



c. means for electrically heating said wheels, said means being mounted proximate said wheels and,

d. means for inducing flow of electricity in said means whereby the heat of the wheels temporarily softens the material to thereby improve mixing of the respective materials in said marginal edges while gradual cooling thereafter hardens and fixes the splice.

3,909,342

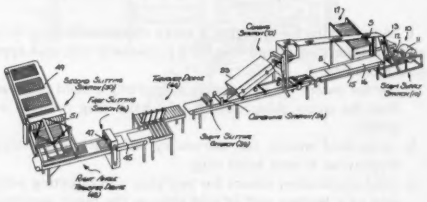
MACHINE FOR MAKING CONTOUR-CORE BLANKETS

Gerald D. Shook, Huntington Station, N.Y., assignor to Baltek Corporation, Northvale, N.J.

Filed June 14, 1973, Ser. No. 369,843

Int. Cl.² B32B *31/10, 31/18;* **B63B** *3/00*

U.S. Cl. 156—522 **7 Claims**



1. A machine for making a tessellated contour-core blanket that is conformable to a contoured surface for lamination thereto by a bonding agent,

a. a coating station,

b. means supplying a web of scrim material to said coating station to apply a coating of adhesive to the underside of the web, said scrim having an open-mesh rendering it permeable to said bonding agent, said coating station including a spreader roll to remove wrinkles from the scrim web entering said station, and a printing roll engaging the undersurface of said web to apply an adhesive solution thereto in a predetermined pattern,

c. a combining station,

d. means to feed a train of balsa panels to said combining station and means including an oven to concurrently pass the coated web through said oven before it enters said combining station to render the adhesive layer tacky, and to then feed the coated web into said combining station to press and bond said coated web to the face of said panels,

e. a scrim-cutting station to cut said scrim web transversely between successive panels in said train to produce a train of scrim-faced panels,

f. a turnover device operatively coupled to the output of said scrim-cutting station reversing the position of said scrim-faced panels to produce a train of scrim based panels,

g. a first slitting machine for receiving the train of scrim-based panels from said turnover device and for slitting same longitudinally to section the panels into parallel strips, and

h. a second slitting station for receiving the train of longitudinally slit, scrim-based panels from the first slitting station and for slitting same transversely to produce blocks, the slitters at said first and second stations being set to fall short of said scrim and to leave a superficial skin holding the blocks together to prevent gaps therebetween and to prevent said bonding agent from seeping into the spaces between said blocks.

3,909,343
APPARATUS FOR FORMING A LAMINATE IN A HEATED-PLATEN PRESS

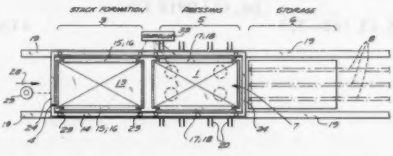
Manfred Posselt, Viersen, Germany, assignor to G. Siempelkamp & Co., Krefeld, Germany

Filed Apr. 5, 1973, Ser. No. 348,013

Claims priority, application Germany, Apr. 11, 1972, 2217396

Int. Cl.² B30B *15/30, 15/34;* **B32B** *31/00*

U.S. Cl. 156—538 **6 Claims**



1. An apparatus for making a laminate, comprising:

a press having a pair of rectangular platens having mutually confronting faces, with a pair of opposite short sides and a pair of opposite long sides;

means for heating said platens;

a support table adjacent one of the short sides of said press for a stack of sheets;

a linear guide extending along said support table and said press;

a carriage displaceable along said guide parallel to said long sides of said press;

two spaced-apart pairs of first jaws on said carriage for gripping said stack along two opposite edges;

two spaced apart pairs of second jaws on said carriage rearwardly of said first jaws for engagement with a stack on said support table while said first jaws engage a stack in said press;

means for displacing said carriage along said guide in a transport direction for transporting said stacks by their edges between and from said platens, said jaws of each pair being spaced apart transverse to said direction by a distance greater than the width of said faces transverse to said direction; and

means for closing said platens on a stack between them while same is held by said first jaws for pressing said stack together.

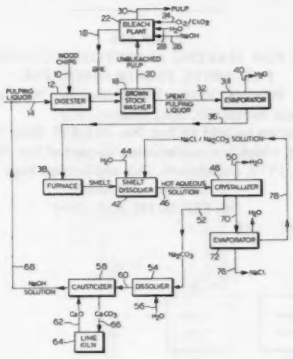
3,909,344
REMOVAL OF SODIUM CHLORIDE FROM PULP MILL OPERATIONS

Jerome A. Lukes, Ogden, Utah, assignor to Erco Envirotech Ltd., Canada

Filed Dec. 3, 1973, Ser. No. 420,876

Int. Cl.² D21C *3/02*

U.S. Cl. 162—19 **33 Claims**



1. In a pulp mill process which comprises digesting cellulosic fibrous material with a pulping liquor containing at least one active pulping chemical, separating the pulped material from spent pulping liquor and forming a solid mass containing sodium carbonate from said spent pulping liquor, the improvement which comprises dissolving at least part of said solid mass in an aqueous material to form a hot aqueous solution thereof, providing sodium chloride in said hot aqueous solution of said solid mass, cooling said hot aqueous solution to crystallize hydrated sodium carbonate therefrom substantially to the point of saturation of the cooled solution with sodium chloride, whereby said crystallized hydrated sodium carbonate is substantially free from contamination by sodium chloride, separating said crystallized hydrated sodium carbonate from the resulting aqueous solution substantially saturated with sodium chloride, evaporating said sodium chloride solution to deposit sodium chloride therefrom, and separating said deposited sodium chloride from the resulting mother liquor.

3,909,345
METHOD OF TREATMENT OF WOOD PULP FOR GREATER EFFICIENCY IN WOOD UTILIZATION

Edward T. Parker, Inkster, and Lester G. Lundsted, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 14, 1972, Ser. No. 314,957

Int. Cl.² D21C *3/20*

U.S. Cl. 162—72 **5 Claims**

1. In a process for the preparation of pulpwood by the digestion of wood chips in an aqueous alkaline liquor in which the total active alkali consists substantially of sodium sulfide and sodium hydroxide at a maximum temperature of 400° F., the improvement which comprises carrying out the digestion in the presence of a digester additive whose structure corresponds to the formula

$$R[(C_2H_4O)_n(C_3H_6O)_m]_zH$$

wherein R is the nucleus of a reactive hydrogen compound, selected from the group consisting of ethylene glycol, propylene glycol, 2,3-butylene glycol, 1,3-butylene glycol, 1,5-pentanediol, 1,6-hexanediol, glycerol, trimethylolpropane, sorbitol, methylamine, ethylamine, propylamine, butylamine, hexylamine, ethylenediamine, 1,6-hexanediamine, diethylenetriamine, piperazine, 2-methylpiperazine, 2,5-dimethylpipera-

zine, acetamide, succinamide, benzenesulfonamide, adipic acid, succinic acid, glutaric acid, aconitic acid, diglycollic acid, citric acid, glycollic acid and ethanolamine, *m* has a value such that the oxypropylene chain has a molecular weight from about 900 to 25,000, and *n* has a value such that the weight of oxyethylene groups constitutes from about 10 to 90 weight percent of the mixture said digester additive is present in an amount of about 0.05 to 1.0% based on the weight of oven dry wood to sufficiently increase the pulp yield.

3,909,346

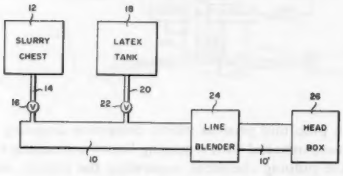
PROCESS FOR MAKING ASBESTOS BACKING SHEETS FOR VINYL FLOOR COVERING

Donald C. Winters, White House Station, N.J., assignor to Congoleum Industries, Inc., Kearny, N.J.

Continuation-in-part of Ser. No. 261,439, June 9, 1972, abandoned, which is a continuation-in-part of Ser. No. 19,757, March 16, 1970, abandoned. This application Sept. 26, 1974, Ser. No. 509,488

Int. Cl.² D21H *5/18, 3/64*

U.S. Cl. 162—155 **6 Claims**



1. A process for continuously producing a sheet of chrysotile asbestos fibers having a latex binder, the process being carried out without chemical additives or precipitating agents for controlling the latex deposition, the process comprising:

a. admitting an aqueous slurry of about 3–6 percent consistency of chrysotile asbestos fibers in water to a process line,

b. admitting at least about 10 percent on a dry weight basis of a synthetic rubber latex binder of about 20–30 percent solids content and free of precipitation controlling agents to said process line so that the ratio of the rates of addition of the asbestos fiber slurry to the latex binder is substantially within the range of about 20:1 to 30:1,

c. introducing the aqueous asbestos fibersynthetic rubber latex mixture into a blender so that the ratio of the volume in gallons of the mixture to the speed of the blender in revolutions per minute is between 1:3 and 1:4 so that the shear forces of the impeller of the blender throw out the latex particles and thereby deposit the latex on the fiber in a controlled manner without chemical deposition controlling agents,

d. thereafter feeding the fibrous slurrybinder mixture to a sheet forming apparatus, and

e. forming a sheet from said slurry mixture.

3,909,347

THERMAL PIPE INSULATION

Herbert Lee Warren, Arlington Heights, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Mar. 8, 1974, Ser. No. 449,222

Int. Cl.² D21D *3/00;* **D21F** *11/00*

U.S. Cl. 162—152 **7 Claims**

1. An improved heat-insulating mineral wool product of the type having mineral wool fibers bonded into a coherent mass by an organic binder, wherein the improvement comprises the inclusion of activated charcoal particles present in an amount of about ½ to about equal to the amount of organic constituents of the product.

3,909,348

UREA-FORMALDEHYDE PIGMENTARY FILLERS USED IN PAPER

Peter Economou, Bedford; John F. Hardy, Andover, both of Mass., and Alfred Renner, Muenchenstein, Switzerland, assignors to Cabot Corporation, Boston, Mass. and Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 390,323, Aug. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 2,427, Jan. 12, 1970, abandoned. This application Sept. 9, 1974, Ser. No. 504,104

Int. Cl.² D21H *3/52*

U.S. Cl. 162—166 **10 Claims**

1. A paper product comprising a paper pulp and as a pigmentary filler an insoluble, infusible, non-porous, particulate urea-formaldehyde polymer having a molar ratio of urea to formaldehyde ranging from about 1:1.3 to about 1:1.8, a BET specific surface area ranging from about 5 to 50 square meters per gram, an absorption capacity for aqueous starch solution ranging from 3.0 to 8.0 gms/gm pigment, and a mean agglomerate size of 3 to 12 microns, wherein the pigmentary filler is present in amounts of from about 0.5 to about 80 percent by weight based on the weight of the dry pulp.

3,909,349

PULP FEED FOR A PAPER MAKING MACHINE

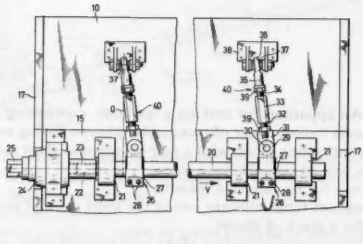
Wolf-Gunter Stotz, Ravensburg, and Otto Hildebrand, Taldorf, both of Germany, assignors to Escher Wyss GmbH, Ravensburg, Germany

Filed Mar. 21, 1974, Ser. No. 453,398

Claims priority, application Switzerland, Apr. 17, 1973, 5455/73

Int. Cl.² D21F *1/04*

U.S. Cl. 162—317 **4 Claims**



1. In combination with a paper-making machine having a permeable element for forming a paper fleece;

a pulp-feed including a nozzle duct terminating at said permeable element to deliver pulp thereto;

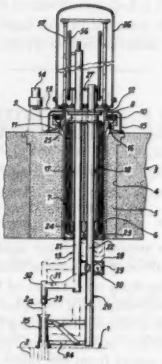
a lip pivotably mounted on a pivot axis for laterally closing said nozzle duct relative to said permeable element; and an adjusting mechanism connected to said lip for pivoting said lip relative to said permeable element to adjust the height of said nozzle duct, said mechanism including an axially movable adjusting rod extending parallel to said pivot axis, and at least one connecting rod pivotally connected to said adjusting rod at one end for pivoting about an axis perpendicular to said adjusting rod and to said lip at an opposite end.

3,909,350

DEVICE FOR HANDLING FUEL ASSEMBLIES WITHIN A NUCLEAR REACTOR CORE

Gerard Dupuy, Paris, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 11, 1973, Ser. No. 359,599
Claims priority, application France, May 18, 1972, 72.17909
Int. Cl. G21c *19/20*
U.S. Cl. 176—30 4 Claims



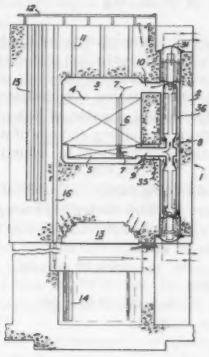
1. A device for handling fuel assemblies within the core of a nuclear reactor, said device being constituted by a group of fuel assemblies placed in adjacent relation in the vertical position and surrounded by a reactor containment vault or vessel structure which provides suitable protection against radiations, wherein said device comprises two arms having synchronized movements, the first arm being constituted by a vertical tubular portion, a right-angled horizontal support bracket fixed at the end of the tubular portion which penetrates into the reactor vessel structure and a vertical sleeve for guiding a handling grab which is provided at the opposite end of the support bracket with respect to the first arm, the second arm being provided with a vertical tubular portion, a right-angled horizontal support bracket disposed in the vertical plane containing the support bracket of the first arm, a vertical cylindrical guide tube which is coaxial with the guide sleeve of said grab, the tubular portions of the two arms being rigidly fixed to each other by means of a sliding coupling and endowed by means of a differential drive system with movements for producing the same effort but applied in the opposite direction in order that the lateral reaction of the grab of the first arm on a fuel assembly should be equal and opposite to the lateral reaction of the cylindrical guide tube of the second arm on the same fuel assembly, the differential system for actuating the two arms comprises a common driving motor for a driving ring-gear which carries two planetary pinionss disposed in meshing engagement with two sun-gears rigidly fixed to two driven output shafts which are disposed in the line of extension of each other and provided with two elements for direct motion transmission to the vertical tubular portions of the two arms.

3,909,351

NUCLEAR REACTOR

Zephyr Tilliette, Chatillon-sous-Bagneux, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 2, 1973, Ser. No. 356,283
Claims priority, application France, May 2, 1972, 72.15555
Int. Cl. G21c *15/00*
U.S. Cl. 176—87 7 Claims



1. A nuclear reactor and especially a high temperature reactor in which provision is made within a vessel which forms a biological shield structure and affords resistance to the pressure of a primary fluid for a main cavity containing a reactor core and a series of vertical cylindrical pods extending through said vessel and arranged in spaced relation around the main cavity, each pod being adapted to communicate with said main cavity through two headers for a primary fluid which flows downwards through the reactor core, the opening of a hot-fluid header being located substantially at the center of each pod, a cold fluid header being located at the top of each pod, wherein each pod contains two superposed steam generator and circulator sets placed in substantially symmetrical relation on each side of said hot primary-fluid header which conveys said fluid from the reactor cavity to the pod, and circulators for both sets being mounted respectively at the bottom and top ends of said pod.

3,909,352

PRODUCTION OF YEAST BIOMASS

Shunichi Akiyama; Munebaru Doi; Yoshiaki Arai; Yoshio Nakao, and Hideo Fukuda, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 22, 1974, Ser. No. 444,800
Claims priority, application Japan, Feb. 22, 1973, 48-21642
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—28 R 3 Claims

1. A method for producing yeast biomass which comprises; cultivating a yeast of the genus Candida, which is sensitive to potassium chloride and is able to assimilate at least one member selected from the group consisting of hydrocarbons, fatty acids, alcohols, oils and fats, in a medium containing at least one of said assimilable carbon sources as a principal carbon source; thereby producing in the cultivated medium the yeast biomass which contains not less than 12 percent by weight of intracellular ribonucleic acid; and recovering said biomass therefrom.

3,909,353

METHOD OF PRODUCING L-PHENYLALANINE BY FERMENTATION

Takayasu Tsuchida, Kawasaki; Hiroshi Matsui, Yokohama; Hitoshi Enei, Zushi, and Fumihiro Yoshinaga, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 447,584, March 4, 1974, abandoned. This application July 18, 1974, Ser. No. 489,805

Claims priority, application Japan, Mar. 12, 1973, 48-28728

Int. Cl.[2] C12D *13/06*

U.S. Cl. 195—29 8 Claims

1. A method of producing L-phenylalanine which comprises:

a. culturing an L-phenylalanine-producing mutant of a parent strain of Brevibacterium under aerobic conditions in an aqueous fermentation medium until a substantial amount of L-phenylalanine accumulates in said medium,

1. said mutant being capable of vigorous growth on a culture medium containing enough of a tryptophan analog substantially completely to inhibit growth of said parent strain,

2. said mutant being further capable of vigorous growth on a culture medium containing enough of a phenylalanine analog substantially completely to inhibit growth of said parent strain,

3. said mutant requiring .L-tyrosine for the growth thereof; and

b. recovering the accumulated L-phenylalanine from said fermentation medium.

3,909,354

PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

Kenneth N. Thompson; Richard A. Johnson, and Norman E. Lloyd, all of Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 88,190, Nov. 9, 1970, Pat. No. 3,788,945. This application Nov. 19, 1973, Ser. No. 417,027The portion of the term of this patent subsequent to Jan. 29, 1991, has been disclaimed.

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—31 F 14 Claims

1. A process of enzymatically converting glucose to fructose comprising continuously introducing a glucose-containing solution having a viscosity of from about 0.5 to about 100 centipoise, a pH in the range of from about 6 to about 9, a temperature in the range of from about 20° to about 80°C. and containing from about 5 to about 80 percent glucose by weight into a zone containing particles of bound glucose isomerase selected from the group consisting of glucose isomerase bound to an anion exchange cellulose and glucose isomerase bound to a synthetic anion exchange resin whereby the particles of the bound glucose isomerase are maintained in suspension and up to 54 percent of the glucose is converted to fructose, the color of the converted solution is increased by less than 2 color units and there is no substantial production of psicose, and withdrawing said converted solution from said zone at a rate substantially equivalent to the rate said glucose-containing solution is introduced into said zone, the particles of the bound glucose being characterized as having a glucose isomerase activity of at least 3 IGIU per cubic centimeter when packed in a bed and a stability value of at least 50 hours.

3,909,355

TREATMENT OF CELLULAR MATERIAL CONTAINING GLUCOSE ISOMERASE

James H. Littlejohn, and Robert G. Dworschack, both of Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Filed Sept. 6, 1973, Ser. No. 394,695

Int. Cl.[2] C12K *1/00, 9/00*

U.S. Cl. 195—31 F 10 Claims

1. A method of improving the flow rate of a liquid through a bed or column of cellular material derived from microorganisms of the Streptomyces genus containing glucose isomerase which has been heated to fix or stabilize the glucose isomerase in or on the cellular material comprising treating said cellular material under suitable conditions and with a sufficient amount of protolytic enzyme whereby a liquid will more readily pass through a bed or column of said cellular material as compared to the passage of the liquid through a bed or column or cellular material not so treated.

3,909,356

PRODUCTION OF FATTY ACID ESTERS OF FRUCTOSE

Takeo Suzuki, Hofu, and Seiga Ito, Machida, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

Filed Aug. 26, 1974, Ser. No. 500,720

Claims priority, application Japan, Aug. 29, 1973, 48-96175

Int. Cl.[2] C12D *13/02*

U.S. Cl. 195—47 6 Claims

1. A process for producing fatty acid esters of fructose, which comprises culturing a fructose-utilizing microorganism capable of producing fatty acid esters of fructose and belonging to the genus *Arthrobacter*, *Corynebacterium*, *Nocardia* or *Mycobacterium* in a medium containing fructose as a carbon source, forming the fatty acid esters of fructose intracellularly and recovering the esters from the microbial cells.

3,909,357

PROCESS FOR THE CONVERSION OF A-SERIES INTO C-SERIES DIGITALIS GLYCOSIDES

Ernst Reinhard, Tubingen-Kressbach; Hans-Martin Boy, Onstmettingen; Kurt Stach, Mannheim-Waldhof; Fritz Kaiser, Lampertheim, and Hans Joachim Lubs, Weinheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

Filed Aug. 27, 1974, Ser. No. 501,010

Claims priority, application Germany, Aug. 29, 1973, 2343400

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—51 R 16 Claims

1. Process for the 12β-hydroxylation of Digitalis glycosides of the A-series, which process comprises incubating a submersion culture of callus tissue of *Digitalis lanata* with an A-glycoside, and isolating the C-series glycosides obtained.

3,909,358

INSOLUBILIZED ENZYMES

William L. Stanley, El Cerrito, and Glenn G. Watters, Albany, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 29, 1974, Ser. No. 464,887

Int. Cl.[2] C07G *7/02*

U.S. Cl. 195—63 8 Claims

1. A process for preparing an insoluble but active enzyme, which comprises:

a. dissolving a soluble enzyme in water,

b. mixing the resulting solution with granules of chitin to cause the enzyme to be adsorbed by the chitin,

c. contacting the chitin containing adsorbed enzyme with an aqueous solution of glutaraldehyde, and

d. separating the resulting enzyme-chitinglutaraldehyde reaction product.

3,909,359

METHOD FOR THE PREPARATION OF CHOLESTEROL OXIDASE

Charles T. Goodhue, and Hugh A. Risley, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,658
Int. Cl.² C12D 13/10
U.S. Cl. 195 9 Claims

1. A process for preparing a cholesterol oxidase enzyme comprising the step of growing the bacterium *Nocardia cholesterolicum* species NRRL 5767 or NRRL 5768 in an aqueous medium comprising a primary carbon source and a secondary carbon source selected from the group consisting of cholesterol, cholest-4-ene-3-one, and cholesteryl linoleate.

3,909,360

PROCESS FOR PRODUCING INSOLUBILIZED ENZYME

Yoshifumi Horiuchi, Mishima, and Shigeyuki Imamura, Shizuoka, both of Japan, assignors to Toyo Jozo Company, Ltd., Japan

Filed Mar. 18, 1974, Ser. No. 452,268
Claims priority, application Japan, Mar. 16, 1973, 48-31263
Int. Cl.² C07G 7/00
U.S. Cl. 195—68 8 Claims

1. A process for producing insolubilized enzyme, which comprises contacting an aqueous solution of an enzyme having substrate specificity for glycerides or glycero-phosphatides represented by the formula:

$$CH_2—OR_1$$

$$CH—OR_2$$

$$CH_2—OR_3$$

wherein R_1 and R_2 are hydrogen or an acyl group, R_1 and R_2 being not hydrogen at the same time, and R_3 is hydrogen, an acyl group, a residual group of phosphoric acid, phosphoryl choline, phosphoryl ethanol amine, phosphoryl serine, or phosphoryl inositol, with a carrier selected from esters of water-insoluble polysaccharides or derivatives thereof containing hydroxyl groups with fatty acids having at least 6 carbon atoms.

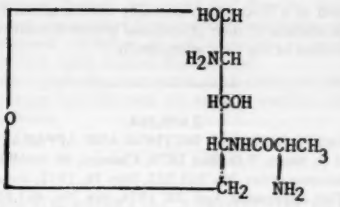
3,909,361

NOVEL ANTIFUNGAL ANTIBIOTIC SUBSTANCE, PROCESS FOR PRODUCTION OF THE SAME, AND AGRICULTURAL AND HORTICULTURAL FUNGICIDAL COMPOSITION CONTAINING SAID SUBSTANCE

Toju Hata; Satoshi Omura; Michiko Katagiri, all of Tokyo; Juichi Awaya, Soka; Shimpei Kuyama, Tokyo; Shizuo Higashikawa, Kunitachi; Kazuomi Yasui, and Haruko Terada, both of Hino, all of Japan, assignors to Nihon Tokushu Noyaku Seizo Kabushiki Kaisha, Tokyo, Japan and The Kitasato Institute, Tokyo, Japan

Division of Ser. No. 272,217, June 17, 1972. This application Mar. 20, 1974, Ser. No. 453,040
Claims priority, application Japan, June 29, 1971, 46-47411
Int. Cl.² C12D 9/00
U.S. Cl. 195—80 R 5 Claims

1. A process for the production of the antifungal antibiotic substance F-1028 having the formula:



or an acid salt thereof,

which comprises cultivating the F-1028 substance-producing strain *Streptomyces Kagawaensis*, nov.sp. or a mutant thereof on a culture medium containing a carbon source, a nitrogen source and a mineral under an aerobic condition, and collecting the F-1028 substance from the cultivated medium.

3,909,362

MICROBIAL PRODUCTION OF ANTI-MICROBIAL 2H-PYRAN-2-ONES

James Jiu, Morton Grove; Stephen Kraychy, Northbrook, and Seth S. Mizuba, Morton Grove, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 28, 1974, Ser. No. 473,515
Int. Cl.² C12D 9/04
U.S. Cl. 195—81 5 Claims

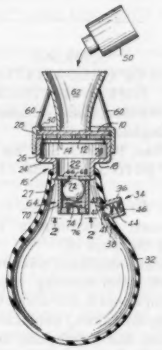
1. A process for simultaneously producing anti-microbial compounds 5,6-dihydro-5(S)-acetoxy-6(S)-(1′,2′-trans-epoxypropyl)2H-pyran-2-one, 5,6-dihydro-5(R)-acetoxy-6(S)-(1′,2′-trans-epoxypropyl)2H-pyran-2-one, and 5,6-dihydro-5(S)-acetoxy-6(S)-(1′,2′-trans-propenyl)2H-pyran 2-one comprising growing *Aspergillus sp.* NRRL 5769 or *Aspergillus sp.* NRRL 5770 in an aqueous nutrient medium containing sitosterol or sitostenone and isolating said anti-microbial compounds.

3,909,363

METHOD FOR TESTING BODY FLUIDS SUCH AS SEMEN

Louis Bucalo, Holbrook, N.Y., assignor to Investors in Ventures, Inc., New York, N.Y.

Filed Sept. 11, 1972, Ser. No. 287,771
Int. Cl.² C12K 1/04
U.S. Cl. 195—103.5 R 4 Claims



1. A method for determining the effectiveness of an interruption in the vasa deferentia, comprising reacting the semen with a glycoside selected from the group consisting of glucoside and mannoside to determine the presence or absence therein of the corresponding glycosidase enzymes which are

contained in a fluid which normally carries sperm from the vas, the absence of such glycosidase enzymes confirming the effectiveness of the vasa interruption.

3,909,364

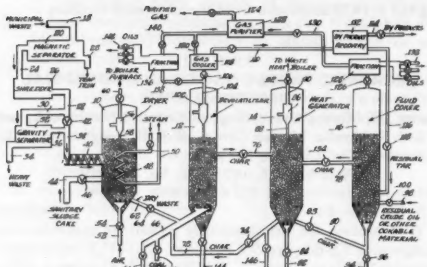
WASTE DISPOSAL METHOD AND APPARATUS

Alamjit D. Singh, P.O. Box 1679, Chicago, Ill. 60690

Continuation of Ser. No. 251,932, May 10, 1972, abandoned. This application Apr. 24, 1974, Ser. No. 463,551

Int. Cl.[2] C10B *51/00, 57/04, 21/20*

U.S. Cl. 201—2.5 14 Claims



1. The method of treating carbonizable waste selected from the class consisting of garbage and sanitary sludge cake which comprises mixing the waste with coal within a carbonizing chamber, and subjecting the mix to the action of heat while in said chamber by mixing hot coal char taken from a separate combustion source therewith whereby to provide a carbonaceous char, the individual particles of which comprise coal char and the carbonized waste.

3,909,365

PRODUCTION OF CHLORINATED PHENOLS OF IMPROVED COLOR

Ray C. Christena, Wichita, Kans., assignor to Vulcan Materials Company, Birmingham, Ala.

Filed Nov. 9, 1973, Ser. No. 414,533

Int. Cl.[2] B01D *3/34;* C23F *11/00, 14/00*

U.S. Cl. 203—6 5 Claims

1. A method for the separation and recovery of pentachlorophenol from dark color-forming impurities contained therein comprising the steps of:

a. introducing into a distilland mixture of pentachlorophenol and dark color-forming impurities an effective amount of from about 0.1 to about 0.5 percent by weight of the impurity-containing pentachlorophenol of a color inhibitor of zinc dust or ethylene thiourea;

b. distilling the resulting color inhibitor containing distilland at a pressure of from about 35 to about 150 mm. Hg and at a temperature of about 195°C. to about 220°C. to separate pentachlorophenol vapors therefrom and

c. condensing said vapor to recover purified pentachlorophenol in an amount of at least 84 percent of the impurity-containing pentachlorophenol.

3,909,366

PURIFICATION OF PROPYLENE OXIDE BY DISTILLATION

John P. Schmidt, New York, N.Y., and Alfredo Garcia, Jr., Cambridge, Mass., assignors to Halcon International, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 665,992, Sept. 7, 1967, which is a continuation-in-part of Ser. No. 586,035, Oct. 12, 1966, abandoned. This application June 28, 1972, Ser. No. 266,962

Int. Cl.[2] B01D *3/34;* C07D *301/02*

U.S. Cl. 203—69 14 Claims

1. A process for purifying propylene oxide containing as impurities hydrocarbons having 5 to 7 carbon atoms which comprises extractively distilling said impure propylene oxide with an extractive distillation solvent consisting essentially of a mono-cyclic aromatic hydrocarbon having 6 to 12 carbon atoms and having a melting point below 50°C in an extractive distillation column wherein said propylene oxide is introduced into said extractive distillation column, said aromatic hydrocarbon is introduced into said column as a separate stream at a point higher than the point of introduction of said propylene oxide, purified propylene oxide is removed as a distillate from said extractive distillation column, and said aromatic hydrocarbon enriched in said hydrocarbon impurities is removed as bottoms from said extractive distillation column.

3,909,367

METHOD FOR CREATING A POLYCHROME MOTIF ON AN OBJECT MADE OF ALUMINUM OR ALUMINUM ALLOY

Jos Patrie, Grenoble, and Francis Allegret, Paris, both of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Feb. 21, 1974, Ser. No. 444,512

Claims priority, application France, Feb. 23, 1973, 73.06481

Int. Cl.[2] B44C *1/04*

U.S. Cl. 204—18 R 3 Claims

1. A method for producing a polychrome motif on an object made of aluminum or aluminum alloy having an anodized surface, comprising applying a bichromated colloid to the surface of the object, exposing the surface to light through a cut of the motif to be reproduced, developing the image thus obtained to effect removal of colloid from the unexposed portions and reduce the cover over the underlying oxidized surface of the object, mounting the object as an electrode in an electrolysis bath containing at least one metal salt selected from those used for the electrochemical coloring of aluminum, passing an alternating current between the electrodes whereupon a coloring effect is produced in the anodized surface of the object corresponding to the unexposed portions of the colloid coating, and removing the remaining colloid, wherein the cut formed in degraded hues provides a progressively variable insolubilization of the colloid with the removal of colloid varying inversely to the amount of insolubilization to provide a variable amount of coloring corresponding inversely to the amount of insolubilization.

3,909,368

ELECTROPLATING METHOD AND APPARATUS

Louis W. Raymond, and Roger E. Reath, c/o Superior Plating Company, 2500 Post Rd., both of Fairfield, Conn. 06430

Filed July 12, 1974, Ser. No. 488,065

Int. Cl.[2] C25D *7/04*

U.S. Cl. 204—26 4 Claims

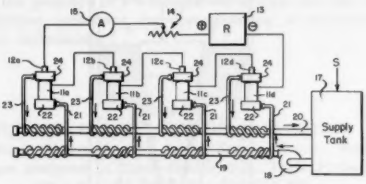
1. Method for simultaneously electroplating the interiors of each of a plurality of hollow metal which comprises,

positioning an anode centrally within each of the hollow objects being electroplated,

electrically connecting said anodes and the objects being electroplated in series with each other and with a source of an electrolyzing current,

continuously supplying an electrically conductive electrolyte solution from a common source of supply of said solution to the interior of each of the hollow objects being electroplated and continuously withdrawing an equivalent quantity of said selectrolyte solution from each of said objects and returning said solution to said common source of supply,

passing an electrolyzing current through the series of anode and electrolyte-containing objects, and



causing the electrolyte solution being supplied to and being withdrawn from each object being electroplated to travel through solution inlet and solution outlet passageways that provide a path of high electrical resistance to the flow of an electric current through the electrolyte solution contained in said passageways, whereby the magnitude of the electrolyzing current flowing from any of the objects being electroplated through said electrolyte solution is reduced to a value that will not significantly affect the electroplating operation taking place in other objects in the series.

3,909,369
METHOD FOR THE PRODUCTION OF AN ELECTRODE FOR CATHODIC PROTECTION

Handady Venkatakrishna Udupa, and Kapisthalam Chetlur Narasimham, both of Tamil Nadu, India, assignors to Council of Scientific & Industrial Research, New Delhi-L, India

Filed May 23, 1974, Ser. No. 472,813
Int. Cl. C25d *5/34, 11/02*
U.S. Cl. 204—29 **5 Claims**

1. A method for the preparation of a lead dioxide coated lead electrode for cathodic protection comprising electrodepositing lead dioxide on a conductive substrate from a lead nitrate-copper nitrate bath, incorporating solid pieces of said lead dioxide into the surface of a lead or lead alloy base and anodizing the obtained base in a chloride medium at a current density not exceeding 6 amperes/dm² at temperatures not exeeeding 50°C for a sufficient length of time to obtain lead based electrode having an adherent coating of lead dioxide thereon.

3,909,370
PROCESS FOR SURFACE TREATMENT OF ZIRCONIUM-CONTAINING CLADDING MATERIALS FOR FUEL ELEMENTS OR OTHER COMPONENTS FOR NUCLEAR REACTORS

Ketil G. Videm; Liv R. Lunde, and Henk H. Kooyman, all of Kjeller, Norway, assignors to Institutt for Atomenergi, Kjeller, Norway

Continuation of Ser. No. 52,759, July 6, 1970. This application Nov. 30, 1972, Ser. No. 310,787
Int. Cl. C25d *5/34*
U.S. Cl. 204—32 R **5 Claims**

1. A method for surface treatment of zirconium to produce a protective coating thereon, said method consisting of:

cleaning said zirconium by submersing the same in a pickling bath containing fluoride ions;

removing said zirconium from the pickling bath and then while still contaminated with fluoride containing residues, subjecting the same to anodic oxidation in the absence of additional fluoride ions until said fluoride containing residues are rendered incapable of interfering with the subsequent oxidation of said zirconium to produce a protective oxide coating thereon; and

thereafter producing a protective oxide coating on the clean zirconium by subjecting the same to surface oxidation conditions.

3,909,371
PROCESS FOR PRODUCING A PROTECTIVE FILM ON AN ALUMINUM SURFACE

Masashi Ikegaya, Shizuoka; Matsuo Suzuki, Yaizu, and Yasuo Aoshima, Shizuoka, all of Japan, assignors to Riken Light Metal Industry Company Limited, Shizuoka, Japan

Filed Oct. 24, 1972, Ser. No. 300,159
Claims priority, application Japan, Oct. 22, 1971, 46-83340
Int. Cl.² C25D *11/18*
U.S. Cl. 204—38 A **1 Claim**

1. A process for forming a coating on an aluminum or aluminum alloy surface which comprises: degreasing, cleaning and water-rinsing the surface; etching the water-rinsed surface with an alkaline solution; neutralizing and water-washing the etched surface; and treating the surface as the anode to form an aluminum oxide layer thereon in an aqueous electrolyte containing 1.0 – 15.0 weight percent of at least one compound which is soluble in the aqueous solution under the experimental conditions selected from the group consisting of, aliphatic primary amines and aliphatic secondary amines; immersing the treated surface in a coating composition comprising 20–50 percent of at least one water-soluble thermosetting resin and 0.1–10 percent of at least one compound soluble in the aqueous solution under the experimental conditions, which compound is selected from the group consisting of, aliphatic primary amines and aliphatic secondary amines and allowing the thus coated aluminum surface to set, dry and harden at 150°–200°C. over a period of 15–30 minutes.

3,909,372
PROCESS FOR TREATING SPENT IRON-CONTAINING CHROMIUM PLATING SOLUTION TO REMOVE IRON VALUES CONTAINED THEREIN AND REGENERATE THE SOLUTION

Akira Fujii, Kawasaki, Japan, assignor to Kabushiki Kaisha Fuji Kuromu Sha, Japan

Continuation of Ser. No. 240,763, April 3, 1972, abandoned. This application Feb. 12, 1974, Ser. No. 441,890
Int. Cl.² C25D *3/04;* **B01D** *9/02*
U.S. Cl. 204—51 **2 Claims**

1. A process for the treatment of iron containing chromium-plating solutions to remove said iron therefrom which comprises treating the chromium-plating solution with chromium trihydroxide to convert all chromium values contained in said chromium-plating solution to a chromium chromate complex compound and, at the same time, convert all iron values contained in said chromium-plating solution to ferric hydroxide; and subjecting the resulting mixture to filtration thereby to separate an aqueous chromium chromate complex compound solution from the ferric hydroxide.

2. A process for the treatment of iron containing chromium plating solutions to remove said iron therefrom and regenerate a chromium plating electrolyte which comprises (i) treating said chromium-plating solution with chromium trihydroxide whereby the chromium values contained in the solution are converted to a chromium chromate complex while simultaneously converting the iron values in the solution to ferric hydroxide; (ii) subjecting the resultant mixture to filtration whereby chromium trihydroxide is separated from the ferric hydroxide; (iii) charging said aqueous chromium chromate complex compound solution into an anode compartment of a diaphragm cell followed by electrolysis, thereby to form a regenerated chromium-plating electrolyte.

3,909,373
NON-CYANIDE ZINC PLATING

Hans-Gerhard Creutz, Yale, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 263,580, June 16, 1972, abandoned, which is a continuation of Ser. No. 20,855, March 18, 1970, abandoned. This application Aug. 6, 1973, Ser. No. 385,940The portion of the term of this patent subsequent to July 24, 1990, has been disclaimed.

Int. Cl.² C25D *3/22*

U.S. Cl. 204—55 R **9 Claims**

1. An aqueous, cyanide-free zinc electroplating bath having a pH of from about 3.5 to 9.6 and including as brightening agents a linear polyether having a molecular weight within the range of about 500 to 1,000,000 and a heterocyclic nitrogen compound in the form of the propyl or isopropyl ester of benzyl chloride nicotinate, said polyether and nitrogen compound being soluble in the bath and further being present in combined amounts sufficient to produce a zinc electrodeposit of improved brightness.

3,909,374
ZINC ELECTROPLATING BATHS AND PROCESS

Carol W. Skimin, University Heights, Ohio, assignor to Kewanee Oil Co., Bryn Mawr, Pa.

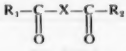
Filed Sept. 27, 1974, Ser. No. 510,089

Int. Cl.² C25D *3/22*

U.S. Cl. 204—55 R **7 Claims**

3. A method of electrodepositing a bright, level finegrained zinc layer on a conductive substrate from an aqueous zinc plating bath containing between about 6 and 45 grams per liter of zinc ions in solution, a brightening agent present in an amount between about 0.4 and 2 grams per liter, 5 to 25 grams per liter of an anionic or non-ionic wetting agent, and a carrier selected from the group consisting of:

a. 1 – 60 milliliters per liter of a compound having a formula



wherein X is absent, or is a vinylene group or a lower alkylene group having from 1 to 3 carbon atoms, and wherein R_1 and R_2 are, independently of one another, hydrogen, or a lower alkyl or alkoxy group having from 1 to 3 carbon atoms;

b. 0.75 – 2 grams per liter of a coffee base derivative selected from the group consisting of caffein, coffee, and decaffinated coffee;

c. between 0.5 and 1 gram per liter of 2-cyclohexene-1-one, and

d. mixtures thereof, comprising passing current through the bath from an anode to the conductive substrate as a cathode at a current density of between 1 and 20 amps per square decimeter while maintaining the bath at a temperature of between 10 and 45 degrees centigrade.

3,909,375
ELECTROLYTIC PROCESS FOR THE PRODUCTION OF METALS IN MOLTEN HALIDE SYSTEMS

Robin David Holliday, Daytona Beach, Fla., and Peter McIntosh, Gladstone, Australia, assignors to Conzinc Riotinto of Australia Limited, Melbourne, Australia

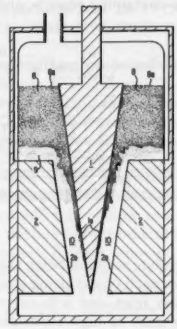
Filed Apr. 9, 1973, Ser. No. 349,472

Claims priority, application Australia, Apr. 17, 1972, 8651/72

Int. Cl.² C25C *3/00, 3/04, 3/06, 3/22*

U.S. Cl. 204—64 R **7 Claims**

1. In the operation of an electrolytic cell for use in the electrolytic production of metals in molten halide systems, which comprises a pair of closely spaced substantially parallel planar non-consumable electrodes inclined at an angle of between 7 and 15 degrees to the vertical, an interelectrode spacing for said molten halide system, the cathode surface being inclined at a positive angle to the vertical and the anode surface being inclined at a similar negative angle to the vertical, the inter-electrode spacing being less than two inches, and a gas separation chamber disposed above and communicating with the inter-electrode space into which gas is discharged upwardly from the inter-electrode space, the area of the melt



surface of said molten halide system in the gas separation chamber and the depth of the electrolyte in the gas separation chamber being sufficient to permit separation of gas from the electrolyte in the gas separation chamber at substantially the same rate as it is produced in the inter-electrode space, the width of the melt surface in the gas separation chamber being not less than

$$\frac{LC}{3M}$$

where

1. C is the current density in amp/cm²
2. L is the cathode length in inches
3. M is the inter-electrode spacing in inches, and the width of the melt surface and the depth of the electrolyte in the gas separation chamber being each not less than twice the inter-electrode spacing.

3,909,376
ELECTROLYTIC MANUFACTURE OF ALKYL-SUBSTITUTED HYDROQUINONES

Dieter Degner, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Rhine, Germany

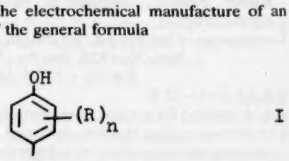
Filed Dec. 4, 1974, Ser. No. 529,284

Claims priority, application Germany, Dec. 5, 1973, 2360494

Int. Cl.² C25B *3/02, 3/04*

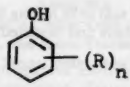
U.S. Cl. 204—73 **9 Claims**

1. A process for the electrochemical manufacture of an alkylhydroquinone of the general formula



I

in which R is alkyl of 1 to 4 carbon atoms and n is an integer from 1 to 3, wherein an alkylphenol of the general formula



II

in which R and *n* have the above meanings, and which is unsubstituted in the para-position to the hydroxyl group, is oxidized anodically in a non-oxidizing aqueous mineral acid and in the presence of a water-soluble ketone, and the reaction mixture containing the corresponding alkylquinone is reduced cathodically.

3,909,377

PURIFICATION OF A CHLORIDE SOLUTION

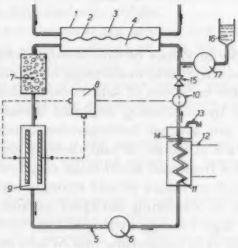
Jean Bizot, Morangis, and Andre Sausse, Sceaux, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Dec. 14, 1972, Ser. No. 315,196

Claims priority, application France, Dec. 14, 1971, 71.44868

Int. Cl. C25b *1/24*

U.S. Cl. 204—95 **3 Claims**



1. In a process for the regeneration of a dialysis liquid containing sodium chloride which is recycled in a haemodialyser, the improvement consisting in destroying at least partially the oxidisable waste matter issuing from the blood through the haemodialysis membrane by electrolysis of said dialysis liquid an electrolysis cell to produce a sufficient amount of sodium hypochlorite to destroy said waste matter.

3,909,378

COMPOSITE CATION EXCHANGE MEMBRANE AND USE THEREOF IN ELECTROLYSIS OF AN ALKALI METAL HALIDE

Peter Newton Walmsley, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 21, 1974, Ser. No. 481,751

Int. Cl.² C25B *1/16, 13/08, 1/26*

U.S. Cl. 204—98 **16 Claims**

1. A composite film of two sections of fluorinated polymer with pendant side chains containing sulfonyl groups, said sulfonyl groups present as ion exchange sites and attached to carbon atoms which have at least on fluorine atom attached thereto; a first section of the polymer constitutes a thickness of not more than one-third of said film at an equivalent weight at least 250 greater than the second section of said film.

3,909,379

RESIN-FORMING COMPOSITION AND USE THEREOF

Masao Gotoda, Hirakata; Kenji Yokoyama, Ikeda; Yoshimi Kono, Amagasaki; Shigekazu Toyonishi, Sakai; Kunio Hiwano, and Takaitsu Shimoyama, both of Hiroshima, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Division of Ser. No. 240,862, March 31, 1972, Pat. No. 3,869,341, Continuation of Ser. No. 35,644, May 8, 1970, abandoned. This application Mar. 27, 1973, Ser. No. 345,333

Claims priority, application Japan, May 9, 1969, 44-35236

Int. Cl.² C08F *2/46, 218/18*

U.S. Cl. 204—159.22 **10 Claims**

1. A cured adhesive and anticorrosion coating on a substrate, said coating comprising an ionizing radiation cured composition initially comprising a solution of about 30–70 parts by weight of diallyl phthalate prepolymer in a mixture consisting essentially of acrylonitrile and at least one alkyl acrylate.

3,909,380

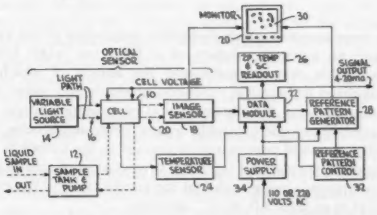
REFERENCE PATTERN ZETA POTENTIAL MEASUREMENT APPARATUS AND METHOD THEREFOR

James T. Day, Maplewood; Robert J. Crosby, Basking Ridge, and Walter R. Wills, Cedar Knolls, all of N.J., assignors to Komline-Sanderson Engineering Corporation, Peapack, N.J.

Filed July 19, 1974, Ser. No. 489,918

Int. Cl.² B01K *5/00*

U.S. Cl. 204—180 R **13 Claims**



1. A method for determining the zeta potential of suspended particles in a fluid comprising the steps of:

a. introducing a sample of said suspended particles into an electrophoresis cell,

b. establishing a predetermined voltage gradient along said electrophoresis cell,

c. displaying the resultant particle movement on a monitor having a variable rate reference pattern,

d. compensating the rate of said reference pattern in accordance with a function related to that temperature of said sample and the voltage gradient along said cell,

e. adjusting said variable rate reference pattern to equal said particle velocity, and

f. determining the zeta potential from the adjusted rate of said reference pattern.

3,909,381

PURIFICATION OF CHROMIUM PLATING SOLUTIONS BY ELECTRODIALYSIS

Robert F. Ehrsam, Monroe, Conn., assignor to John L. Raymond, Fairfield and Robert Z. Reath, Easton, both of, Conn.

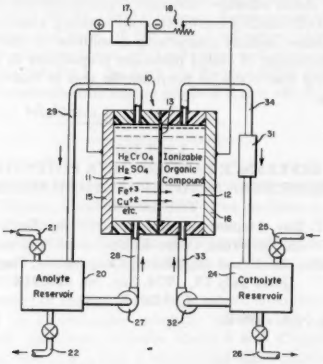
Filed Nov. 18, 1974, Ser. No. 524,794

Int. Cl.² B01D *13/02;* **C02C** *5/12*

U.S. Cl. 204—180 P **11 Claims**

1. In the process for removing dissolved metallic cation contaminants from an aqueous solution of chromic acid by electrodialysis in an electrodialysis cell having an anolyte compartment containing an anode and a catholyte compart-

ment containing a cathode, said anolyte and said catholyte compartments being separated by a cation permeable membrane, in which process the contaminated chromic acid solution is contained in said anolyte compartment and comprises the anolyte of said cell, an aqueous solution of an ionized electrolyte is contained in said catholyte compartment and comprises the catholyte of said cell, and an electric current is passed between said anode and said cathode through said anolyte and said catholyte to cause contaminating metal cations to migrate from the anolyte through the cation permeable membrane into the catholyte,



the improvement which comprises employing as the catholyte an aqueous solution of at least one water soluble ionizable organic compound the anions of which are oxidized to harmless oxidation products and water when reacted with the chromic acid-containing anolyte, the solubility of said ionizable organic compounds being such that the total concentration thereof in the catholyte is at least 1 Normal and the ionic dissociation of said organic compounds being such that the conductivity of the catholyte is at least 1.0×10^{-4} mho/cm.

3,909,382

METHOD OF RECOVERING ACID VALUES FROM DILUTE STREAMS AND IMPROVED ALKYLENE OXIDE PROCESS USING SAME

Andrew G. Mueller, Taylor; Michael Krumpelt, Riverview, both of Mich.; Walter A. Pitteroff, Esslingen (Neckar), Germany; Shyam D. Argade, Woodhaven, and Joseph F. Louvar, Lincoln Park, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 9, 1974, Ser. No. 530,814

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—180 P **18 Claims**

1. A method for recovering values of strongly ionizing acid from a dilute stream containing said acid, said method comprising

leading said dilute stream as feed to diluting chambers of a low-concentration stage of a multiple-stage electrodialysis unit,

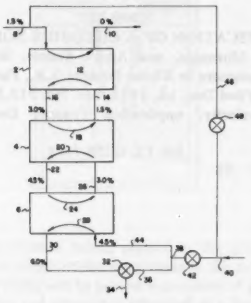
said multiple-stage electrodialysis unit comprising a plurality of stages, said stages being operated at different levels of concentration of acid,

each of said stages comprising a plurality of cells, said cells containing a plurality of alternated cation-permeable and anion-permeable membranes so spaced apart as to provide between them a plurality of alternating concentrating chambers and diluting chambers,

concentrating chambers of said cells having wash streams entering said concentrating chambers and enriched streams leaving said concentrating chambers,

diluting chambers of said cells having feed streams entering said diluting chambers and depleted streams leaving said diluting chambers,

the cells of a stage of lower average hydrogen-ion concentration being operatively connected with the cells of a stage of higher average hydrogen-ion concentration in such a manner that the depleted streams of the cells of said stage of higher average hydrogen-ion concentration form the wash streams of cells of said stage of lower average hydrogen-ion concentration, and the enriched streams of said cells of lower average hydrogen-ion concentration form the feed streams of said cells of high average hydrogen-ion concentration,



a stream low in values of said strongly ionizing acid being withdrawn from said multi-stage electrodialysis unit, said stream low in values of said strongly ionizing acid being obtained by combining depleted streams of cells of a stage of low average hydrogen-ion concentration, and a stream rich in values of said strongly ionizing acid being withdrawn from said multi-stage electrodialysis unit, said stream rich in values of said strongly ionizing acid being obtained by combining enriched streams of the cells of a stage of high average hydrogen-ion concentration,

each of said cells comprising one of said stages being operated under conditions such that the difference in hydrogen-ion concentration between liquid in concentrating chambers of a cell and liquid in diluting chambers of the same cell does not exceed 0.8 Normal.

3,909,383

CLEANING PROCESS

Masamichi Sato, Asaka, Japan, assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 819,526, April 24, 1969, abandoned. This application Mar. 12, 1973, Ser. No. 340,159The portion of the term of this patent subsequent to Dec. 1, 1987, has been disclaimed.

Int. Cl.[2] B01D *43/00;* **F03C** *5/00*

U.S. Cl. 204—186 **7 Claims**

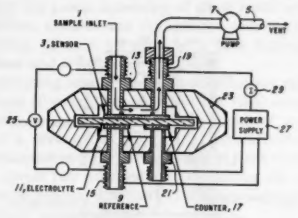
1. A method for separating suspended solid particles and dissolved absorbate material from an insulating liquid wherein the liquid is contaminated with toner particles, dyes, fixing agents, stabilizers or electric charge regulators deposited in the liquid by contacting it with a xerographic imaging surface after said surface has been developed by contacting it with a liquid developer comprising removing said suspended particles from said insulating liquid by contacting said insulating liquid and said suspended solid particles with a particulate filtering material of particle size less than 1 mm capable of acquiring an electrical charge upon contact with said insulating liquid, said electrical charge having a polarity opposite the polarity of the electrical charge acquired by said suspended particles in said insulating liquid whereby said suspended particles are attracted to and deposit on said filtering material.

3,909,384

ELECTRO-CHEMICAL SENSORS FOR TRACE GASES

Raymond J. Jasinski, and Isaac Trachtenberg, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 18, 1973, Ser. No. 370,898
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 G 1 Claim



1. An electro-chemical sensor system comprising:

a first electro-chemical gas sensing cell having a doped chalcogenide glass consisting of about 60 mole percent selenium, 28 mole percent germanium, 12 mole percent antimony and containing as a dopant about 1% to about 4% by weight of iron, an electrical conductor electrically connected to said glass on one side, an electrolyte contacting the other side of said glass, and at least one electrode contacting said electrolyte,

a second electro-chemical gas sensing cell having a doped chalcogenide glass consisting of 15% $Mn\text{-}As_2S_3$, an electrical conductor electrically connected to said glass on one side, an electrolyte contacting the other side of said glass, and at least one electrode contacting said electrolyte,

means for introducing a gas sample into said first and second cells so as to impinge upon the respective glasses thereof,

said first cell being responsive to the presence of gaseous NO_2 and more strongly oxidizing gases to produce an electrical signal between the first-mentioned electrical conductor and one of the first-mentioned at least one electrode and said second cell having responsive to the presence of gases more strongly oxidizing than NO_2 to produce an electrical signal between the second-mentioned electrical conductor and one of the second-mentioned at least one electrode, and

means for measuring the electrical signals developed by said first and second cells in response to the introduction of the gas sample thereinto so as to indicate whether NO_2 and more strongly oxidizing gases are present in the gas sample.

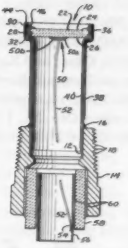
3,909,385

OXYGEN SENSOR FOR AUTOMOTIVE USE

David H. Spielberg, Schaumburg; Roy E. Svacha, Barrington; Kenneth R. Janowski, Wheaton, and George L. Hervert, Woodstock, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 4, 1973, Ser. No. 394,431
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 S 8 Claims

1. An oxygen sensor adapted for use in an automotive exhaust stream wherein it must be repeatedly subjected to rapidly changing temperatures from ambient to as high as 1700°F. comprising a corrosion resistant tubular metal housing portion; coupling means on a body portion integral with the housing portion for mounting the sensor to complementary coupling means in the engine exhaust path so that the exterior surface of the housing portion can be positioned in the said exhaust path to be contacted by the exhaust stream and the internal surface of the housing portion can be contacted by a reference oxygen source; a wafer of oxygen sensitive solid electrolyte material positioned in a plane at right angles to the axis of the tubular housing portion, said wafer being mounted in a recess in said one end of the housing portion so as to be mechanically restrained against inward axial movement by a ledge portion formed in said housing portion, said wafer closing the end of said tubular housing portion and having opposed outer and inner sampling gas and referenoe gas contacting surfaces; hermetic fastening and sealing means comprising a metal oxide frit fired to said body member at a temperature higher than 1700°F after said body member has been pre-oxidized, and to said wafer; said sealing means, said tubular metal housing portion, and said wafer having thermal expansion characteristics which are sufficiently close to permit said



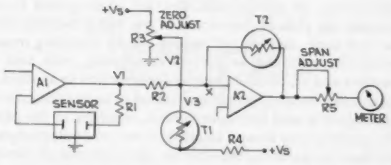
hermetic seal to remain intact through a temperature range of at least −30°F to 1700°F when said wafer and housing are positioned in close proximity to each other; a pair of electrodes bonded to the sampling surface and to the reference surface of said wafer; means for electrically connecting one of said pair of electrodes to said body member; means including a lead wire portion connected to the other of said pair of electrodes and passing through the reference end of said body member for permitting an electrical connection to be made remotely from said wafer; a sleeve-like insulation member positioned internally of said body member at the reference end thereof for preventing electrical contact between said last named means and said body member, and aperture means at the reference end of said body member for permitting a reference oxygen source to communicate with the reference surface of said wafer.

3,909,386

GAS DETECTOR UNIT

Harry G. Oswin, Chauncey, and Howard W. Bay, Long Island, both of N.Y., assignors to Energetics Science, Inc., Elmsford, N.Y.

Continuation-in-part of Ser. No. 88,267, Nov. 10, 1970, Pat. No. 3,776,832, and a continuation-in-part of Ser. No. 172,486, Aug. 17, 1971, Pat. No. 3,824,167, and a continuation-in-part of Ser. No. 263,531, June 16, 1972, Pat. No. 3,824,168. This application Sept. 11, 1972, Ser. No. 287,806
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 R 5 Claims



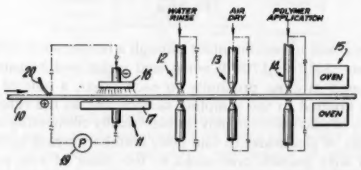
1. A gas detecting and measuring unit for detecting and quantitatively measuring a gas in a gaseous medium compris-

ing in combination intake means, an electrochemical cell, means for drawing a gas through said intake means and into said electrochemical cell at a controlled flow rate, readout means for reading the quantity of said detected gas, and an electronic circuit comprising two thermistors; both said thermistors being arranged with said cell to sense the temperature of said cell; one thermistor compensating change in background current with temperature and the other compensating change in span with temperature; said circuit automatically adjusting for background and span for any change in temperature sensed by said thermistors, whereby said cell provides a substantially constant signal for a given volume of sample at varying temperatures.

3,909,387
APPARATUS FOR PRODUCING POLYMER-COATED ALUMINUM PRODUCTS

Edwin S. Kolic, Gahanna, Ohio, and Sigmund Bereday, Bayamon, P.R., assignors to Sigmund Bereday, New York, N.Y.

Division of Ser. No. 130,310, April 1, 1970, Pat. No. 3,799,848. This application Oct. 30, 1973, Ser. No. 411,083
Int. Cl.² C25D *17/00*
U.S. Cl. 204—206 **13 Claims**

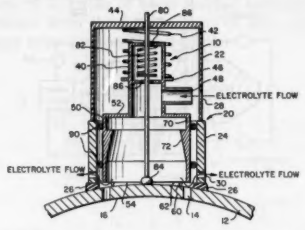


1. Apparatus for the continuous surface-processing of a member of aluminum metal, comprising means for continuously transporting the metal member in and successively through a first electrolytic treatment zone for establishing a polymer-active member surface, a second washing and drying zone, and a third polymer-applying zone for coating the polymer-active surface; said apparatus in the electrolytic treatment zone comprising hydraulic-circuit means including a wetting head in adjacency above and generally directed at the metal member as it passes through said zone, said circuit means further including a reservoir for containing electrolyte and means for continuously supplying electrolyte from said reservoir to said head to discharge the same at the passing metal member, temperature sensing means for sensing the electrolyte temperature at the wetting head, heater means associated with said reservoir including temperature control means for controlling the temperature of the electrolyte in said reservoir in accordance with the temperature sensed at said wetting head, and said circuit further including electrolyte-recirculation means including a collection pan for establishing an electrolyte-collection level spaced from and beneath the path of movement of the metal member through the first zone, and electric-supply means including means for anodically effecting an electrical coupling with said metal member and a cathodic electrical connection to an electrically conducting member which is adapted to be in contact with the electrolyte in said hydraulic circuit, whereby in the presence of a continuously flowed electrolyte stream of electrolyte from said head to the metal member an electrochemical circuit may be completed via said stream; washing and drying means in the second zone; and liquid coating means in the third zone for applying to the member a liquid composition of film-forming polymeric organic compound.

3,909,388
SELF-CONTROLLED SPRING-ACTUATED TOOL ADVANCE FOR ELECTROCHEMICAL MACHINING

Charles L. Faust, and John A. Gurklis, both of Columbus, Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 9, 1974, Ser. No. 531,147
Int. Cl.² C25F *1/00*
U.S. Cl. 204—224 M **17 Claims**



1. A trepanning electrode adapted to be used in an electrochemical machining operation comprising:

a hollow body, said body comprising first and second longitudinally adjacent hollow segments;

a spring means for controlling advancement of the electrode towards a workpiece, said spring means being positioned on said first body segment;

spacer means for separating said electrode from said workpiece, said spacer means being positioned on said second body segment in such a manner as to oppose advancing force exerted by said spring means; and

insulating means positioned on the inside of said second segment for preventing contact between material removed from said workpiece and said electrode.

3,909,389
PREPARATION OF PITCH

Paul J. Ruckel, and Melvin M. McFeeters, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 345,389, March 27, 1973, abandoned. This application July 26, 1974, Ser. No. 491,973
Int. Cl.² C10C *3/04*
U.S. Cl. 208—4 **10 Claims**

1. In a process for preparing petroleum pitch by air blowing of residues produced by the catalytic cracking of gas oils, the improvements which comprise (1) use, as a feedstock, of residues having a specific gravity above 1.040 and containing at least 85 weight percent aromatics and (2) the process is conducted in a manner such that not more than about 10 weight percent, based on the feedstock, of the vapors boiling above about 250°F, resulting from the air blowing operation, are vented.

3,909,390
COAL LIQUEFACTION PROCESS

Peter Urban, Northbrook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 289,502, Sept. 15, 1972, Pat. No. 3,846,275. This application July 29, 1974, Ser. No. 492,641
Int. Cl.² C10G *1/06*
U.S. Cl. 208—10 **7 Claims**

1. A process for producing hydrocarbonaceous liquid products from coal which comprises the steps of:

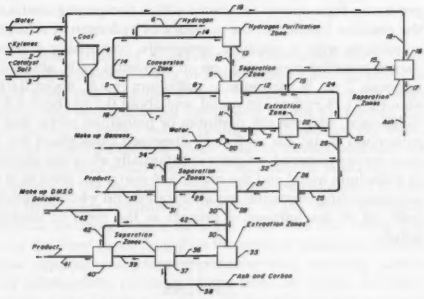
a. contacting the coal, at a temperature of from about 150° to about 375°C. and a pressure of from about 10 to about 300 atmospheres for a contact time corresponding to

from about 1 to about 600 minutes or a liquid hourly space velocity of from about 0.16 to about 1.0, with from about 100 weight percent to about 1000 weight percent of water, a reducing gas selected from the group consisting of hydrogen, carbon monoxide and mixtures thereof in an amount of from about 0.5 to about 175 SCF per pound of carbon in the coal, and from about 0.01 weight percent to about 1000 weight percent of a catalyst consisting essentially of a catalytic sulfur compound selected from the group consisting of alkali metal and ammonium sulfites, sulfides and thiosulfates, and separating the resulting mixture to provide a first hydrocarbonaceous phase and a first aqueous phase;

b. contacting said first hydrocarbonaceous phase with from about 10 weight percent to about 1000 weight percent of water at a temperature of from about 10° to about 150°C. and a pressure of from about atmospheric to about 25 atmospheres for a contact time of from about 0.1 minute to about 100 minutes, and separating the resulting mixture to provide a second hydrocarbonaceous phase and a second aqueous phase;

c. admixing said second hydrocarbonaceous phase with from about 10 weight percent to about 1000 weight percent of a first solvent comprising an aromatic hydrocarbon at a temperature of from about 10° to about 150°C. and a pressure of from about atmospheric to about 25 atmospheres for a contact time of from about 0.1 minute to about 100 minutes, separating the resulting mixture to provide a first, liquid solvent phase comprising the first solvent and a first hydrocarbonaceous product and a first raffinate phase, and recovering the first hydrocarbonaceous product from the first solvent phase; and,

d. admixing said first raffinate phase with from about 10 weight percent to about 1000 weight percent of a second solvent comprising a mixture of from about 50 weight percent to about 95 weight percent of an aromatic hydrocarbon component and from about 5 weight percent to about 50 weight percent of a polar hydrocarbonaceous component at a temperature of from about 10° to about 150°C. and a pressure of from about atmospheric to about 25 atmospheres for a contact time of from about 0.1 minute to about 100 minutes, separating the resulting mixture to provide a second, liquid solvent phase comprising the second solvent and a second hydrocarbonaceous product and a second raffinate phase, and recovering the second hydrocarbonaceous product from the second solvent phase.



3,909,391

RECOVERY OF ALUMINUM CHLORIDE/PALLADIUM CHLORIDE HYDROCRACKING CATALYST MIXTURE

Robert W. Rieve, Springfield, and Harold Shalit, Drexel Hill, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 351,075, April 13, 1973, Pat. No. 3,847,795. This application Aug. 5, 1974, Ser. No. 494,659

Int. Cl.² B01J *23/96, 31/30;* C07C *3/18;* C10G *13/08*

U.S. Cl. 208—108 7 Claims

1. A method for the recovery of an aluminum chloride-palladium chloride hydrocracking catalyst mixture utilized in hydrocracking high molecular weight hydrocarbons containing sulfur and nitrogen compounds at temperatures of from 400° to 1200°F. at pressures of from 100 psig to 5000 psig with from 100 to 5000 standard cubic feet of hydrogen per barrel of hydrocarbon charge, said catalyst being soluble in said hydrocarbons at said temperatures which comprises the steps of

cooling the hydrocarbon reaction products to at least about 250°F. to substantially insolubilize and precipitate said catalyst;

removing the hydrocarbon reaction products leaving a bottoms fraction containing aluminum chloride-palladium chloride catalyst concentrate; and

recovering said bottoms fraction catalyst concentrate for reuse, said concentrate being soluble in said hydrocarbons at said hydrocracking temperatures.

3,909,392

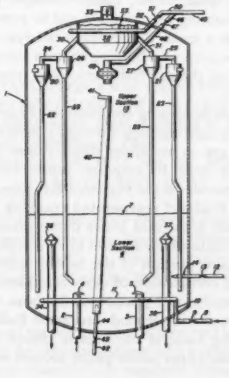
FLUID CATALYTIC CRACKING PROCESS WITH SUBSTANTIALLY COMPLETE COMBUSTION OF CARBON MONOXIDE DURING REGENERATION OF CATALYST

Carl Joseph Horecky, Jr., Texas City, Tex.; Robert James Fahrig, Lansing, Ill.; Robert James Shields, Jr., Hammond, and Claude Owen McKinney, Munster, both of Ind., assignors to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 262,049, June 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 203,396, Nov. 30, 1971, abandoned. This application May 22, 1974, Ser. No. 472,111

Int. Cl.² C10G *11/18;* B01J *29/38*

U.S. Cl. 208—120 29 Claims



1. In a process for catalytically cracking petroleum feedstock wherein fluidizable cracking catalyst which has been

deactivated with coke deposits is withdrawn from the cracking reaction zone, stripped of volatile material, passed to a regeneration zone, and recycled after regeneration to the reaction zone, the method comprising:

a. contacting deactivated, coked catalyst particles with oxygen-containing regeneration gas to provide an excess of oxygen in a regeneration zone and burning substantially all of the coke from the catalyst particles at regeneration temperatures;

b. initiating and sustaining combustion of carbon monoxide produced by said burning through contact with oxygen-containing gas in the regeneration zone at a temperature sufficient to combust substantially all of the carbon monoxide in the regeneration zone but not so high that said cracking catalyst is thermally deactivated;

c. providing a sufficient amount of catalyst in the regeneration zone to absorb a major portion of the heat of combustion liberated by said combustion of carbon monoxide and to maintain said carbon monoxide combustion temperature;

d. conducting said substantially complete combustion of carbon monoxide in the regeneration gases undergoing combustion, with the velocity of gases in the regeneration zone being such to provide contact of said regeneration gases with fluidized cracking catalyst particles in an amount sufficient to absorb a major portion of the heat of combustion liberated by said combustion of carbon monoxide and to maintain said carbon monoxide combustion temperature;

e. absorbing said major portion of the heat of combustion of carbon monoxide in said fluidized cracking catalyst particles in direct heat-exchange contact with regeneration gases undergoing combustion in said regeneration zone and thereby maintaining said temperature for combusting substantially all of the carbon monoxide in the regeneration zone;

f. withdrawing from the regeneration zone effluent gas having a low content of carbon monoxide; and

g. withdrawing from the regeneration zone regenerated catalyst particles having a low content of residual coke for passage to said reaction zone.

8. In a process for catalytically cracking petroleum feedstock wherein fluidizable cracking catalyst which has been deactivated with coke deposits is withdrawn from the cracking reaction zone, stripped of volatile material, passed to a regeneration zone, and recycled after regeneration to the reaction zone, the method comprising:

a. contacting deactivated, coked catalyst particles with oxygen-containing regeneration gas to provide an excess of oxygen in a lower dense-phase catalyst section of the regeneration zone and burning therein substantially all of the coke from the catalyst particles at regeneration temperatures;

b. initiating and sustaining combustion of carbon monoxide produced by said burning through contact with oxygen-containing gas in an upper dilute-phase section of the regeneration zone to combust substantially all of the carbon monoxide in the regeneration zone;

c. circulating fluidized regenerated cracking catalyst particles upwardly from said lower dense-phase section into said upper dilute-phase section in an amount sufficient to absorb a major portion of the heat of combustion liberated by said combustion of carbon monoxide;

d. absorbing said major portion of the heat of combustion of carbon monoxide in said circulated fluidized regenerated cracking catalyst particles in direct heat-exchange contact in said upper dilute-phase section with said regeneration gas;

e. withdrawing from the regeneration zone effluent gas having a low content of carbon monoxide; and

f. withdrawing from the regeneration zone regenerated catalyst particles having a low content of residual coke for passage to said reaction zone.

RJB

3,909,393
TRIMETALLIC REFORMING CATALYST AND USE THEREOF

Max Michel, Montmorency, France, assignor to Societe Francaise des Produits pour Catalyse, Rueil-Malmaison, France

Filed Aug. 6, 1973, Ser. No. 385,647

Claims priority, application France, Aug. 16, 1972, 72.29387

Int. Cl. C10g *35/08;* **B01j** *11/78, 11/12*

U.S. Cl. 208—139 **7 Claims**

1. A catalyst, which comprises an alumina carrier 0.005–1% of platinum, 0.005–1% of iridium and 0.005–5% of niobium by weight with respect to the alumina carrier.

6. A process of catalytically reforming hydrocarbons at 450°–600°C, wherein the improvement comprises employing a catalyst according to claim **1.**

3,909,394
CATALYTIC REFORMING WITH A CATALYST CONTAINING PLATINUM OR PALLADIUM AND RUTHENIUM

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 291,138, Sept. 21, 1972, abandoned. This application Jan. 18, 1974, Ser. No. 434,736

Int. Cl.² C10G *35/08*

U.S. Cl. 208—139 **17 Claims**

1. A process for catalytic reforming of a gasoline fraction to produce a high-octane reformate which comprising contacting the gasoline fraction in the presence of hydrogen at reforming conditions with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium metal, about 0.01 to about 2 wt. % ruthenium metal, and about 0.1 to about 3.5 wt. % halogen, wherein the platinum or palladium metal and the ruthenium metal are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium metal and the ruthenium metal are present in the corresponding elemental metallic states, and wherein substantially all of the halogen is present in the form of conbined halide.

3,909,395
PROCESS FOR THE ODOR REMOVAL OF MALODOROUS SULFUR CONTAINING OLEFINIC DERIVATIVES

Edward Andrew Takacs, South Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 23, 1974, Ser. No. 508,300

Int. Cl.² C09F *3/02;* **C10G** *27/04, 29/22*

U.S. Cl. 208—196 **11 Claims**

1. A method for the upgrading of a malodorous, sulfur-contaminated aliphatic, aromatic, or cyclic olefinic derivative or mixture thereof which comprises the steps of: contacting said malodorous sulfur-contaminated olefinic derivative or mixture thereof with between about 0.1 and about 5.0 percent, by weight, of a per(lower)alkanoic acid, at a temperature ranging from minus(−) 10°C. to 80°C., water washing the so-treated olefinic derivative, and thereafter recovering an odor-improved, storage-stable, sulfur-reduced olefin.

3,909,396
DESULFURIZATION PROCESS START-UP METHOD

Mark J. O'Hara, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 20, 1972, Ser. No. 299,477

Int. Cl.² C10G *23/02*

U.S. Cl. 208—213 **5 Claims**

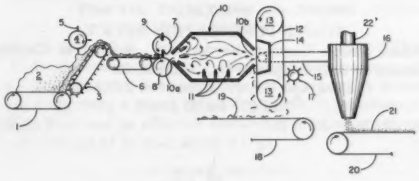
1. In a process for the hydrodesulfurization of a hydrocarbonaceous charge stock utilizing a catalytic composite comprising one or more metallic components selected from the group consisting of Group V-B, Group VI-B and Group VIII of the

Periodic Table and a carrier material of alumina and silica, which catalytic composite experiences deactivation as a result of adsorbed water therein, the improved method of start-up which comprises drying said catalytic composite, in a non-reducing atmosphere, under static conditions including a temperature above 100°C. and without forced flow of vaporous material through the composite, prior to contacting the composite with said charge stock.

3,909,397
FIBER RECOVERY SYSTEM AND METHOD OF RECOVERY

Karl E. Aldinger, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 26, 1973, Ser. No. 427,460
Int. Cl. B07b *1/10*
U.S. Cl. 209—3 **4 Claims**



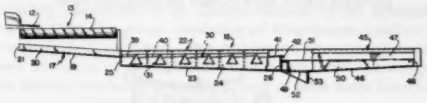
1. A fiber recovery apparatus for recovering fibers from fiber-sheet composite waste products which have the fibers in a fluff form and retained at least in part by covering sheet material, the said apparatus comprising means for feeding the waste products, cutter means positioned to receive the waste products from said feeding means, and to further feed and cut the products into small pieces, agitator means positioned for the receipt of the cut pieces and to work the cut pieces to free fibers from other component material of the waste products, a vertical traveling screen having a front and rear reach and having the front reach facing on the agitator means for receipt of the agitated and cut components, said traveling screen being substantially pervious to the fiber-air stream and substantially impervious to others of the component material directed to the screen so that said others of the components will be received on the front reach of the traveling screen, means including a hood to collect the air-fiber stream passing through the front reach of the traveling screen, means to intercept and remove the said other component material of the waste material as said other components travel on the screen and means communicable with said hood to receive the fresh-air stream and separate the fibers received in said hood from the fiber-air stream, said agitator means including a housing having an inlet fronting toward the cutter means and an outlet opening towards the front reach of the traveling screen, and said housing incorporating air jet means mounted between the inlet and outlet for pneumatically agitating and suspending the said cut pieces and pneumatically conveying them to the front reach of the screen through said outlet, while providing a differential air pressure across the front reach of the screen.

3,909,398
BONE DROPOUT PAN

Gordon C. Leonard, Dalton, Ga., assignor to Meat Separator Corporation, Dalton, Ga.

Filed Oct. 16, 1973, Ser. No. 407,018
Int. Cl. B03b *3/04*
U.S. Cl. 209—156 **3 Claims**

1. The method of separating meat from bone fragments having slight differences in their respective specific gravities comprising the steps of providing a pan having a plurality of substantially horizontally disposed troughs extending from side to side and partitions intermediate said troughs causing water having the meat and bone fragments entrained therein to flow slowly over said pan in a direction normal to said troughs so as to maintain a mean depth of water of approximately ¼ to ⅜ inches above said partitions, creating eddy currents in said water in the area of the mouth of each of said



troughs for both separating the meat from the bone fragments and guiding the bone toward one of said troughs, permitting the water within each of said troughs to remain substantially static so that the heavier bone fragments sink into said troughs while the lighter meat is carried along by the flow of water, separating the meat from the flow of water, and discharging the water from said pan.

3,909,399
FROTH FLOTATION METHOD FOR RECOVERY OF MINERALS

Vojislav Petrovich, 1925 W. Schiller St., Chicago, Ill. 60622

Continuation-in-part of Ser. No. 251,458, May 8, 1972, abandoned. This application Nov. 6, 1973, Ser. No. 409,773
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **6 Claims**

1. An improved of (oxidic) of beneficiating ores and minerals selected from the group of oxide ores and minerals or iron, chromium, cerium, yttrium, antimony, and phosphorous by froth flotation process to produce a froth concentrate of desired metal value which improvement comprises; effecting the froth flotation of the ore by treating the comminuted ore of the mineral slurry of aforesaid ores and minerals with inorganic oxidizing agents, followed by an effective amount of a collector-frother of an olefine (alkyl vinyl) or polyolefine (alkyl polyvinyl) carbinol adduct of alkyl polyhydroxycarboxylic acids, said olefine or polyolefine carbinols have from 8 to 14 carbon atoms, said adducts have from 10 to 24 carbon atoms, said alkyl polyhydroxycarboxylic acid (having at least 6) have from two to six hydroxyl groups per molecule; and recovering a froth concentrate relatively rich in the desired metal values to leave tailings relatively poor in the desired metal values.

3,909,400
APPARATUS FOR FRACTIONATING FIBER SUSPENSIONS IN ACCORDANCE WITH FIBER LENGTH

Peter Seifert, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Filed Aug. 28, 1973, Ser. No. 392,263
Int. Cl.² B07B *1/20*
U.S. Cl. 209—240 **3 Claims**

1. Apparatus for classifying a slurry of paper making fibers of a range of lengths into two fractions wherein the classified fibers are predominantly of lengths greater or less than a predetermined intermediate control length respectively, comprising:

a. a housing,

b. a cylindrical screen member within said housing chamber separating the interior thereof into a screen chamber and a discharge chamber on opposite sides of said screen member,

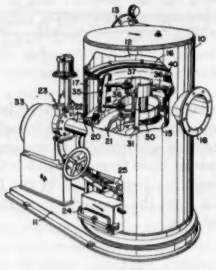
c. inlet means for supplying the slurry to one end of said screen chamber,

d. said screen member having multiple slots therethrough extending generally axially thereof and of substantially greater length than width,

i. the width of each said slot being substantially less than said control fiber length,

ii. said slots being spaced circumferentially of said screen member to provide a land between each pair of adjacent slots which is of a width less than said control fiber length,

e. primary outlet means for continuously removing from said discharge chamber slurry containing fibers and other particles which have passed through said slots,



f. means for causing the slurry to circulate generally circumferentially of said screen chamber and thereby to cause fibers of greater length than said control length to hairpin on said lands rather than to pass through said slots,

g. means for causing periodic pulsations through said slots to dislodge hair-pinned fibers from said lands for continued travel toward said other end of said screen chamber, and

h. secondary outlet means for continuously withdrawing slurry including such dislodged fibers from said other end of said screen chamber.

3,909,401

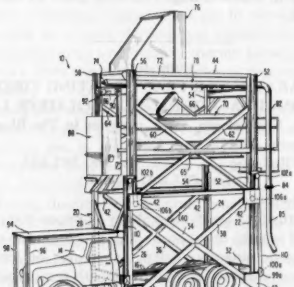
MOBILE MATERIAL SCREENING TOWER

Floyd Edwin Thompson, 2004 Broadlawn, Dubuque, Iowa 52001

Filed Dec. 10, 1973, Ser. No. 423,389

Int. Cl. B07b *1/46*

U.S. Cl. 209—412 **4 Claims**



1. A portable material screening tower comprising

a base,

a plurality of wheel members supported on said base,

a first vertically disposed framework having its lower end secured to said base,

a second vertically disposed framework telescopically received by said first framework,

power means to raise and lower said second framework with respect to said first framework,

a material screening mechanism having a discharge end and a second end and means securing said screening mechanism to said second framework,

a material reception hopper having means pivotally securing said hopper to the upper end of said second framework and having one position for receiving the unscreened material and guiding same to said mechanism,

a discharge chute extending outwardly from said discharge end of said material screening mechanism,

means pivotally connecting said chute to said second framework,

a water conduit having inlet and discharge nozzles,

means affixing said conduit to said second framework wherein said nozzles are disposed above and directed at said mechanism and said inlet is disposed near the lower end of said second framework.

3,909,402

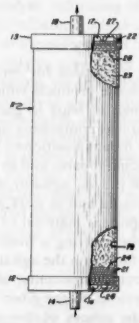
WATER PURIFICATION DEVICE

William Joseph Gartner, Bartlett, Ill., assignor to Gartner Research & Development Co., Bartlett, Ill.

Filed Apr. 13, 1972, Ser. No. 243,644

Int. Cl.² B01D *15/00*

U.S. Cl. 210—27 **9 Claims**



1. A water purifier suitable for removing chlorine from water comprising a vertically disposed, elongated vessel having an inlet at the bottom thereof and an outlet at the top thereof, retention means for a granular adsorbent near the inlet of said vessel and near the outlet of said vessel, and a granular adsorbent comprising activated carbon between said respective retention means, said retention means near said outlet comprising a filter element, said filter element having sufficient resistance to the flow of water therethrough so that a back pressure from about 5 to about 20 psi prevails in said vessel when water at ambient temperature is passed outwardly through said outlet retention means at a rate of 5 gallons per hour per square inch of said retention means near said outlet.

3,909,403

PROCESS OF TREATING WASTE WATER

Akira Abe, and Yoshio Usui, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 18, 1973, Ser. No. 407,760

Claims priority, application Japan, Oct. 23, 1972, 47-106060

Int. Cl.² B01D *15/04, 15/06*

U.S. Cl. 210—32 **19 Claims**

1. A process of treating waste water containing ferricyanide ions and ferrocyanide ions which comprises bringing said waste water containing these ions into contact with a weakly-basic anion-exchange resin for adsorption of ferricyanide and ferrocyanide ions on said resin, removing said weakly-basic

anion-exchange resin having adsorbed thereon ferricyanide and ferrocyanide ions from said waste water, immersing said weakly-basic anion-exchange resin having said ferricyanide and ferrocyanide ions adsorbed thereon into an alkaline solution to provide an alkaline concentrated solution of said ferricyanide and ferrocyanide ions, adding to said alkaline concentrated solution a strong alkali, a hypochlorite, and bromide ions so that the pH of said solution is above 12, and heating said solution to temperatures about 50°C at normal pressure, whereby said ferricyanide and ferrocyanide ions are decomposed, wherein said bromide ions serve to accelerate the heat decomposition of ferricyanide ions and ferrocyanide ions during said heating.

3,909,404

COMPOSITION AND PROCESS FOR ELECTRODEPOSITING A BLACK CHROMIUM DEPOSIT

William A. Boycott, Old Castle, Canada, assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Feb. 26, 1973, Ser. No. 335,602

Int. Cl.² C25D *3/08, 3/56*

U.S. Cl. 204—43 R **7 Claims**

1. An aqueous acidic black chromium electroplating solution having fluoride ions in an amount of about 0.5 to about 2 g/l, comprising a about 100–400 g/l CrO_3 in the absence of sulfate ions, and an effective blackening amount of selenium in the amount of at least about 0.1 g/l.

3,909,405

METHOD FOR TREATING ALKALINE WASTE STREAMS CONTAINING ALUMINUM DISSOLVED THEREIN

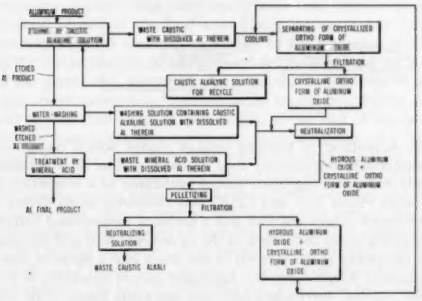
Yoshio Aoyama, Kyoto, Japan, assignor to Dai-Doh Plant Engineering Corporation, Osaka, Japan

Filed Apr. 4, 1973, Ser. No. 347,767

Claims priority, application Japan, Apr. 7, 1972, 47-35346; July 29, 1972, 47-76363

Int. Cl.² C02B *1/20*; **C02C** *5/02*

U.S. Cl. 210—46 **15 Claims**


ALUMINUM PRODUCT
ETCHED Al PRODUCT
WATER-WASHING
WASHED ETCHED Al PRODUCT
Al FINAL PRODUCT
WASTE CAUSTIC ALKALI
WASTE CAUSTIC WITH DISSOLVED Al THEREIN
COOLING
SEPARATING OF CRYSTALLIZED ORTHO FORM OF ALUMINUM OXIDE
FILTRATION
CAUSTIC ALKALYNE SOLUTION FOR RECYCLE
CRYSTALLINE ORTHO FORM OF ALUMINUM OXIDE
WASHING SOLUTION CONTAINING CAUSTIC ALKALINE SOLUTION WITH DISSOLVED Al THEREIN
NEUTRALIZATION
TREATMENT BY MINERAL ACID
WASTE MINERAL ACID SOLUTION WITH DISSOLVED Al THEREIN
HYDROUS ALUMINUM OXIDE + CRYSTALLINE ORTHO FORM OF ALUMINUM OXIDE
PELLETIZING
FILTRATION
NEUTRALIZING SOLUTION
HYDROUS ALUMINUM OXIDE + CRYSTALLINE ORTHO FORM OF ALUMINUM OXIDE

1. In a method for treating an alkaline waste stream containing aluminum dissolved therein by hydrolyzing the aluminum, whereby colloidal hydrous aluminum would be obtained, the improvement comprising conducting said hydrolysis substantially completely by neutralization of the alkaline waste stream with an acid to a pH of substantially 7 in the presence of a crystalline ortho aluminum hydroxide having an average particle diameter of about 0.5 to about 500μ in an amount of about 1 to about 5 kg per kilogram of said aluminum, whereby non-colloidal hydrous aluminum is precipitated on said crystalline ortho aluminum hydroxide, wherein the concentration of aluminum in said waste stream is from 0.01 % to the saturated concentration thereof.

3,909,406

CLARIFYING AGENTS FOR WATER

John L. Lang, P.O. Box 1242, Midland, Mich. 48640

Continuation-in-part of Ser. No. 144,416, May 17, 1971, abandoned. This application Feb. 22, 1972, Ser. No. 228,336

Int. Cl.² C02B *1/20*

U.S. Cl. 210—47 **1 Claim**

1. The process for purification of water which comprises the mixing of impure water with a water-hydratable material consisting essentially of an alumino-silicate of an element selected from the group consisting of magnesium, calcium, strontium, zinc, cadmium, iron, manganese, and copper, prepared by fusion of raw materials containing them optionally with density-regulating minerals having at least some ion-exchange characteristics.

3,909,407

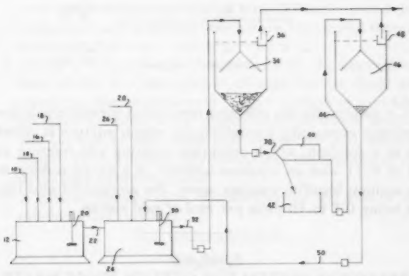
TREATMENT OF WOOL SCOURING WASTES

Willis A. Heisey, Denver, Pa., assignor to Geo. W. Bollman & Co., Inc., Adamstown, Pa.

Continuation-in-part of Ser. No. 347,126, April 2, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,246

Int. Cl.² C02B *1/20*

U.S. Cl. 210—49 **4 Claims**



4. A continuous process for treating wool scouring waste liquors comprising, in combination:

adding acid maintaining a pH range of 3.0–3.5 and bentonite at a rate to yield a weight to volume concentration of 0.3% to a continuously flowing, constantly agitated, waste liquor in a tank at a temperature in the range of 190°–200°F and at a flow rate through the tank yielding an approximate retention time of 15 minutes in the tank; adding lime at a rate to yield a weight to volume concentration in the range of 1.0–2.0% and flocculating the continuously flowing, constantly agitated, acidulated liquor in a second tank at a temperature in the range of 200°F at a flow rate through the second tank yielding an approximate retention time of 15 minutes in the tank forming a conditioned sludge;

separating the conditioned sludge in a settling tank maintained at approximately 200°F to form a disposable supernatent liquor and a settled non drainable sludge; and

centrifugally separating the settled non drainable sludge to form disposable liquid and solid constituents, where the temperature during the acidulating step and the weight to volume concentration of lime are selected from the ranges described to obtain a non drainable sludge.

3,909,408
PROCESS FOR TREATING ALDEHYDES

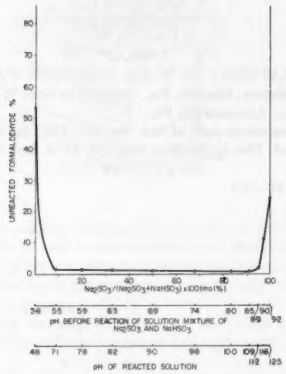
Shinichi Ishida, Tokyo; Noboru Oshima, Yokohama; Kunio Kurita, Kawasaki; Isamu Suzuki, Yokohama, and Hidetoshi Ohno, Kamakura, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 229,326, Feb. 25, 1972, Pat. No. 3,829,379. This application Jan. 2, 1974, Ser. No. 429,765

Claims priority, application Japan, Feb. 27, 1971, 46-9794; Feb. 27, 1971, 46-9795; May 18, 1971, 46-32928The portion of the term of this patent subsequent to Aug. 13, 1991, has been disclaimed.

Int. Cl.² C02B *1/18*

U.S. Cl. 210—59 **2 Claims**


UNREACTED FORMALDEHYDE %
Na2SO3/(Na2SO3+NaHSO3)x100(mol%)
pH BEFORE REACTION OF SOLUTION MIXTURE OF Na2SO3 AND NaHSO3
pH OF REACTED SOLUTION

1. A process for the effective removal of formaldehyde from a mixture containing formaldehyde, which mixture is either a gas or a solution, which comprises treating said mixture at a pH of 6–11 with an aqueous solution of a mixed sodium sulfite-sodium bisulfite treating agent, the amount of said bisulfite being 0.1 to 10 mols per mol of said sulfite.

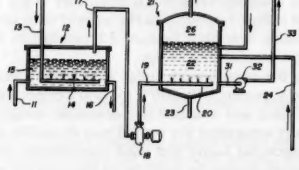
3,909,409
RECOVERY SYSTEM FOR OXYGEN FROM WASTE WATER OXYGENATION

Kenneth Wilson Lange, Burr Ridge, and James Bernard Maher, Oak Brook, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed June 12, 1974, Ser. No. 478,504

Int. Cl.² C02B *1/34*

U.S. Cl. 210—60 **5 Claims**



1. The method which comprises:

introducing substantially pure gaseous oxygen through waste water, having a high biochemical oxygen demand (BOD), in a first enclosed receptacle;

separating an effluent stream of gas containing oxygen mixed with nitrogen, carbon dioxide, water vapor, and other gases present in trace quantities, from the oxygenated waste water;

feeding the effluent stream of gas into a pool of liquid oxygen in a second enclosed receptacle and thereby solidifying the carbon dioxide and converting the water vapor to ice;

separating a gas stream containing oxygen, nitrogen, and other gases present in trace quantities, from the liquid oxygen;

cooling the gas stream from the liquid oxygen to a temperature low enough to condense the oxygen, but not the nitrogen, in the said gas stream, separating the condensed and liquefied oxygen from the nitrogen gas, returning the liquefied oxygen to the pool of liquid oxygen and venting the remaining gas to a disposal means; and

vaporizing liquid oxygen from the pool and delivering the pure oxygen gas to the waste water in the first enclosed receptacle.

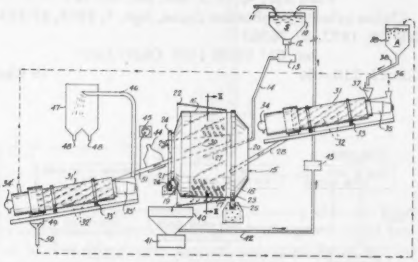
3,909,410
PROCESS FOR TREATING SEWAGE SLUDGE

Heinz H. Neukamm, Brantford, Canada, assignor to W. Elmo Young, London; Harold J. Young, Mount Albert; T. Lloyd Young, Brampton and Mary Joan Tanner, London, all of, Canada

Continuation of Ser. No. 333,539, Feb. 20, 1973, abandoned. This application Aug. 8, 1974, Ser. No. 495,891

Int. Cl.² C02B *1/02*

U.S. Cl. 210—71 **1 Claim**



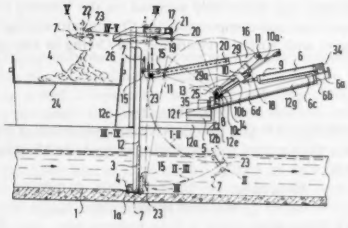
1. A method of treating sewage sludge which comprises continuously introducing into a lower region of a rotating contactor drum aggregate pieces preheated to a temperature between about 212° and 325°F, said contactor drum having a perforated cylindrical wall and a series of longitudinal baffles extending along the length of the cylindrical wall and dividing the periphery of the interior of the drum into a series of compartments which carry the aggregate pieces upwardly as the drum rotates, distributing onto said aggregate pieces while still in the lower region of the drum a slurry of sewage sludge whereby a portion of the slurry adheres to the aggregate pieces as a coating thereon, removing through said perforations any slurry which does not adhere to the aggregate pieces and recycling this into the slurry being fed into the drum, carrying the coated aggregate pieces within said compartments to an upper region of the drum, in said upper region dumping the coated aggregate pieces in said compartments into an inclined collector trough which extends substantially the full length of the contactor drum, directing the coated aggregate pieces from the trough along a downwardly inclined chute, subjecting the coated aggregate pieces on the inclined chute to external heat to effect drying of the coating both from within by virtue of the heat of the aggregate piece and from without, thereafter subjecting the aggregate pieces with dried

slury encrustation thereon to a tumbling action in an inclined tumbler drum to break away and pulverize such encrustations, separating said pulverized sludge from the aggregate pieces by means of an air current, collecting the pulverized encrustations and recycling the decoated aggregate pieces through the system with sufficient fresh aggregate pieces being added to the recycled decoated aggregate pieces to maintain a constant flow of aggregate pieces through the system.

3,909,411
GRATE RAKE FOR CLEANING A GRATE ARRANGED IN A WATER CONDUIT

Eduard Angele, Langenhagen; August Schreiber, and Jurgen Seipp, both of Vinnhorst, all of Germany, assignors to August Schreiber, Hannover-Vinnhorst, Germany

Filed Apr. 16, 1974, Ser. No. 461,380
Claims priority, application Germany, Apr. 18, 1973, 2319699; Mar. 11, 1974, 2411626
Int. Cl.² B01D *29/38, 35/02*
U.S. Cl. 210—159 **13 Claims**



1. A grate rake for cleaning a grate arranged in a water conduit, including a rake handle, a rake comb, means pivotally connecting said comb to said handle, means for moving said comb from a position of rest above the water surface level into an initial working position at the lower end of said grate and from this position along a working travel with its teeth engaging through between the grate bars and collecting the accumulated oversize material on the grate, Upward into an emptying position and back again, said rake handle, in the position of rest of the said rake comb, occupying an initial position which is inclined oppositely to the direction of flow of the water slightly downward and forward toward the bars of the grate, and means to carry out the movements of the rake comb comprising a crank arm, means connecting one end of said crank arm to said handle at the end of the latter remote from said comb by an articulation containing a horizontal pivoting axis, stationary means pivoting the other end of said crank arm about a horizontal axis behind the grate, a first double-acting cylinder and piston unit pivoted at one end to said crank arm, a second stationary pivot means, means connecting the other end of said first cylinder and piston unit to said second stationary pivot means, a second double-acting cylinder and piston unit, means pivotably attaching said second cylinder and piston unit at the rear end of the rake handle at a point spaced from the articulation between the crank arm and the rake handle, and a rake comb guide arranged parallel to the said grate bars and extending upwardly approximately to the level of the rake comb emptying position.

3,909,412
ROOF DRAIN ARRANGEMENT

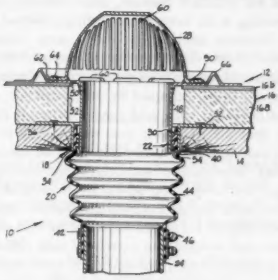
Francis Joseph Patry, Lewiston, Maine, assignor to Johns-Manville Corporation, Denver, Colo.

Filed July 22, 1974, Ser. No. 490,648
Int. Cl.² E03F *5/14*
U.S. Cl. 210—166 **8 Claims**

1. In a roofing system including a horizontal roof deck and a built-up roof thereon, a roof drain arrangement comprising: a. a vertically extending tubular deck connector extending downwardly from the top surface of said deck through an opening therein, said tubular deck connector including horizontal flange means located at its top end fastened to the top surface of said deck;

b. a tubular drain pipe connector having a top vertically extending end portion located concentrically within at least a portion of said tubular deck connector and fixedly connected with an internal circumferential surface thereof, said tubular drain pipe connector extending out the bottom end of said tubular deck connector;

c. a vertically extending tubular drain member having a bottom portion located concentrically within said top portion of said tubular drain pipe connector, said tubular



drain member including horizontal flange means vertically spaced above said flange means of said tubular deck connector such that said built-up roof is located therebetween;

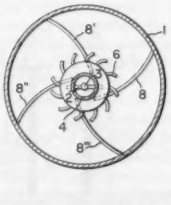
d. resilient means fixedly connected with the internal surface of the top end portion of said tubular drain pipe connector for allowing said bottom portion of said tubular drain member to be readily inserted within said top end portion of said drain pipe connector and, once inserted, for preventing its removal out the top end of said drain pipe connector; and

e. a strainer located over and around the top end of said tubular drain member.

3,909,413
FLOTATION MACHINE

Tatsuya Nagahama, Tokyo, Japan, assignor to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 333,681, Feb. 20, 1973, abandoned.
This application Aug. 22, 1974, Ser. No. 499,770
Claims priority, application Japan, Feb. 21, 1972, 47-17838
Int. Cl.² B01D *1/14*
U.S. Cl. 210—219 **6 Claims**



1. A froth flotation machine, comprising: a flotation cell having a continuous peripheral side wall and a bottom wall defining a flotation zone for containing a flotation liquid; a centrifugal pump impeller centrally located in said cell, said impeller being rotatable about a vertical axis and being disposed close to but spaced upwardly from the bottom wall of the cell, said impeller comprising a plurality of circumferentially spaced elongated impeller blades extending parallel to

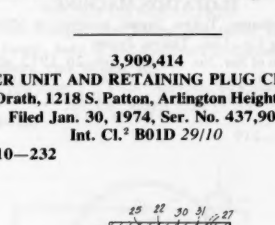
said bottom wall for moving the flotation liquid adjacent thereto substantially horizontally and radially outwardly toward said side wall; a stationary diffusing unit encircling said impeller and being disposed at the same vertical level in said cell as said impeller, said diffusing unit comprising an annularly arranged series of substantially uniformly circumferentially spaced-apart, outwardly extending guide vanes arranged in a circular array and located in the flow path of the liquid from the impeller for guiding and directing the flow of the liquid from the impeller outwardly from said diffusing unit toward said side wall at a vertical level located close to but spaced upwardly from said bottom wall, the inner edges of said guide vanes defining a cavity within which said impeller is disposed for rotation therein, said diffusing unit having a central opening in its bottom providing a liquid flow passage extending between said cavity and a zone located adjacent said bottom wall and disposed directly below said impeller and said diffusing unit; an air inlet pipe for introducing air into the flotation liquid being pumped by said impeller, said air inlet pipe communicating with said cavity through the upper end thereof so that air is drawn into said cavity in response to rotation of said impeller; and a plurality of circumferentially spaced-apart continuous stationary suction guide blades mounted on and projecting upwardly from said bottom wall, said suction guide blades extending inwardly from circumferentially spacedapart locations adjacent to said side wall along said bottom wall toward the center of said cell and into said zone to a position directly underneath said impeller and said central opening of said diffusing unit, said suction guide blades defining therebetween horizontal open flow paths for flotation liquid, said open flow paths being open along their tops and closed along their bottoms and sides, said flow paths being of progressively narrower width in a direction from said side wall toward the center of said cell for directing return flow of flotation liquid to said cavity to increase the volumetric rate of return flow of flotation liquid into said cavity in response to rotation of said impeller and thereby to increase the rate of air flow into said cavity, the upper edges of said guide blades in said zone being located directly below and closely spaced from the lower edges of said impeller and said guide vanes, so that rotation of said impeller will draw air into said cavity and will mix the air with the flotation liquid and will forward the mixture of air and flotation liquid through said diffusing unit toward said side wall, and flotation liquid will return to said impeller along said bottom wall of said cell guided by said suction guide blades for repeated flow through said diffusing unit.

3,909,414

FILTER UNIT AND RETAINING PLUG CLOSURE

Edwin H. Drath, 1218 S. Patton, Arlington Heights, Ill. 60005

Filed Jan. 30, 1974, Ser. No. 437,904
Int. Cl.² B01D *29/10*
U.S. Cl. 210—232 **6 Claims**



1. A filter unit especially suitable for pressure material lines, comprising:

a rigid generally cup-shaped housing providing a cylindrical chamber open at one end, having a supply port opening through the central portion of a bottom wall in the chamber and at least one delivery port opening through a portion of the cylindrical wall of the chamber;

a generally cylindrical filter screen within said chamber having one end seated about said supply port and its opposite end adjacent to the open end of the chamber;

a generally cylindrical coarse mesh retainer interposed between said screen and the cylindrical wall of the chamber and also seated about said delivery port and providing a firm support against blowout for the screen and multiple connected passages from about the screen leading to the delivery port;

means closing the chamber and including a disk member dimensioned to engage against the outer end of the retainer screen and having a wedging inward projection against the outer end portion of the filter screen;

an annular groove in the housing adjacent to its open end and about the perimeter of the closure disk;

a centering and sealing O-ring in said groove engaging the perimeter of the disk and normally projecting above the crown of the disk; and

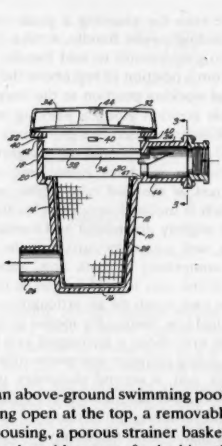
a closure cap removably secured on the housing over said open end and compressing the O-ring into sealing engagement with surfaces confining the O-ring in said groove.

3,909,415

ANTI-SIPHON VALVE FOR SWIMMING POOL LINT POT

Cecil G. Young, La Canada, Calif., assignor to Muskin Corporation, Colton, Calif.

Filed Sept. 27, 1974, Ser. No. 510,003
Int. Cl.² E04H *3/20*
U.S. Cl. 210—234 **4 Claims**



1. A lint pot for an above-ground swimming pool or the like, comprising a housing open at the top, a removable lid engaging the top of the housing, a porous strainer basket positioned inside the housing, releasable means for locking the lid to the housing to close and seal the top, the housing having an inlet portion extending from the side of the housing adjacent to the top, the inlet portion having an inlet hole opening into the interior of the housing for admitting water, the housing having an outlet portion adjacent the bottom of the basket, water passing from the inlet to the outlet through the strainer basket, a flap valve member positioned on the outside of the opening, means hingedly supporting the flap valve member in position to close said inlet hole, water flowing into the housing urging the hinged flap valve member toward the closed position, and valve opening means connected to the flap valve member and movable therewith, said valve opening means coming into engagement with the lid when the lid is moved to the locked position, said valve opening means holding the flap valve member away from the inlet hole when the lid is in the locked position.

3,909,416

METHOD AND APPARATUS FOR SEPARATING LIQUIDS OF DIFFERENT SPECIFIC GRAVITIES FROM A MIXTURE OF THE SAME

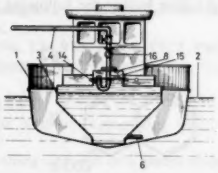
Cornelis In't Veld, Vlaardingen, Netherlands, assignor to Hydrovac Systems International, Inc., New York, N.Y.

Filed June 23, 1971, Ser. No. 155,815

Claims priority, application Netherlands, Nov. 10, 1970, 7016406

Int. Cl.² E02B *15/04*

U.S. Cl. 210—242 **1 Claim**



1. In a barge-mounted vacuum system for removing oil from the surface of a body of water: apparatus comprising a barge supporting a sealed separating tank with a bottom, sidewalls diverging upwardly and outwardly, and a closed top, conduit means for introducing liquid into said tank with a first open end of said conduit located within casing means with a closed bottom and open top; said casing being supported so that the open end of said conduit is sealingly maintained in communication with liquid collected by said casing means from said body of water, said conduit near a second open end thereof comprising a portion extending downwardly through the closed top of said sealed tank with said portion further comprising a U-shaped bend extending upwardly locating the second open end of the conduit within the tank near the top portion thereof, reversible pump means for filling or emptying said tank with water, said pump means being in fluid communication by conduit means near the bottom of said tank whereby said reversible pump means may be utilized to discharge the liquid contents of said tank and to fill said tank with water from said body of water, float control means in said tank constructed and arranged to cause said pump maans to introduce liquid into said tank responsive to a low liquid level therein and to discharge liquid from said tank with a high liquid level therein whereby in operation of said apparatus water introduced into said tank and thereafter discharged therefrom causes a negative pressure within said tank so that liquid within said casing means is caused to flow into the upper portion of said tank and the filling and emptying of said tank is repeated so that the contents of said tank substantially comprises oil which may be discharged from said tank by said pump means.

3,909,417

DEVICE FOR DAMPING THE SURGE OF WATER WAVES PARTICULARLY FOR A FLOATING BODY DESIGNED TO CLEAN POLLUTED WATER

Johann Rafael, Maxstrasse 36, Salzburg, Austria

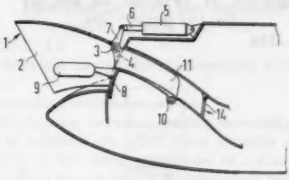
Filed Sept. 25, 1973, Ser. No. 400,632

Claims priority, application Germany, Sept. 25, 1972, 2246957

Int. Cl.² E02B *15/04*

U.S. Cl. 210—242 **8 Claims**

1. A floating body for cleaning polluted water having a device for damping the surge of water waves comprising an inlet opening in said floating body, an outrigger pivotally mounted on said floating body in front of said inlet opening, said outrigger being fully or partly immersable in water and including a damping body having a portion which extends substantially parallel to the surface of the water, means mounted on the floating body and connected to said damping body for damping the oscillating movements of said damping body caused by said water waves, a peeling body pivotally mounted in said inlet opening of said floating body, floating



means connected to said peeling body in front of said inlet opening, and means pivotally connecting said outrigger to said peeling body.

3,909,418

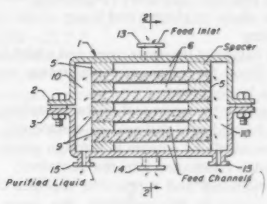
METHOD FOR FORMING A LAMINATE MEMBER AND APPARATUS UTILIZING THE SAME

Jack A. Hunter, Claremont, Calif., and Kenneth E. Anderson, Deerfield, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 15, 1973, Ser. No. 323,614

Int. Cl.² B01D *31/00*

U.S. Cl. 210—336 **4 Claims**



1. Apparatus employing semi-permeable means for separating the constituents of a fluid feed material, which comprises in combination;

a. a plurality of stacked laminate members;

b. each laminate member having semi-permeable membranes each side of a central porous filler material which permits fluid flow therethrough;

c. spacing means in association with edge portions of each laminate member thereby forming internal fluid channels between said plurality of stacked laminate members for the feed material flow between such spaced members;

d. an impregnating fluid seal material embodied into and impregnated through the entire thickness of the end portions of the porous filler material for each of said laminate members to prevent fluid flow from such end portions;

e. a passageway through at least one entirely impregnated and sealed end portion of each member and such passageways in the plurality of members being positioned to effect multiple flow paths and a resulting serpentine extended length fluid flow path provided through said internal fluid channels between said members;

f. fluid feed inlet means to one end of said extended length flow path and fluid outlet means from the opposing end thereof; and

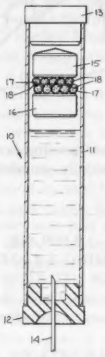
g. a separated fluid collection means in communication with the unsealed porous and longitudinal edge portions of each laminate member to obtain a fluid constituent which passes through the semi-permeable membranes of the laminate members to the porous filler material.

3,909,419

PLASMA SEPARATOR WITH SQUEEZED SEALANT

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,367
Int. Cl.[2] B01D *21/26*
U.S. Cl. 210—518 **5 Claims**



1. A separator assembly, capable of separating blood into its component light phase or plasma and heavy phase or cellular portion comprising:

a. a container having at least one open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase;

b. a closure sealing the open end of the container, the closure being formed of a self-sealing elastomeric material which is penetrable by a cannula through which blood to be separated is conducted into the container;

c. a pair of cylinders and rupturable capsules of sealant slidably mounted in the container, the upper cylinder having a specific gravity greater than the light phase, the lower cylinder having a specific gravity less than the heavy phase, and the combined cylinders plus capsules having a specific gravity between the two phases of blood; and

d. said rupturable capsules of sealant having a specific gravity between the two phases of blood and being interposed between the two cylinders, whereby when centrifugal force is used the blood separates into its light and heavy phases, the cylinders move through the light phase and come to a stop at the top of the heavy phase, and the pressure between the cylinders ruptures the capsules and releases the sealant to form a seal slightly above the interface between the phases.

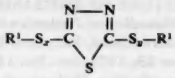
3,909,420

LUBRICANT COMPOSITION CONTAINING THIADIAZOLES AND NAPTHYLAMINES AS ANTIOXIDANTS AND METHOD OF LUBRICATION USING SAID COMPOSITION

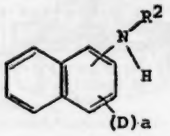
Byron W. Turnquest, Chicago; Tai S. Chao, Homewood, and Victor E. Broman, Palos Park, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 161,947, Sept. 9, 1971, Pat. No. 3,775,321. This application Sept. 26, 1973, Ser. No. 401,093The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.
Int. Cl.[2] C10M *1/38*
U.S. Cl. 252—47 **16 Claims**

1. A lubricating oil composition comprising a major proportion of mineral oil of lubricating viscosity; at least one sulfur-containing compound having the following structure;



wherein each R^1 is a monovalent hydrocarbon radical containing from 1 to about 30 carbon atoms, x and y are each integers from 1 to about 9, the sum of x and y being at least 2; and at least one napthyl amine having the following structure;



wherein R^2 is selected from the group consisting of hydrogen and monovalent hydrocarbon radicals containing from 1 to about 30 carbon atoms, a is an integer from zero to 7 and D is a monovalent hydrocarbon radical containing from 1 to about 30 carbon atoms, said sulfur-containing compound and said naphthyl amine each being present in an amount sufficient to improve the resistance to oxidation of said lubricating oil composition.

RJW

3,909,421

METHOD OF MAKING HIGH VISCOSITY AQUEOUS MEDIUMS

Preston G. Gaddis, 203 S. Osage, Bartlesville, Okla. 74003

Continuation of Ser. No. 173,286, Aug. 19, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,661
Int. Cl.[2] E21B *43/20*
U.S. Cl. 252—8.55 D **10 Claims**

1. In a method of increasing the viscosity of an aqueous medium wherein a particulate hydratable polymer having a molecular weight in excess of 10,000 is to be admixed with the aqueous medium to increase its viscosity, the improvement which comprises:

dispensing the aqueous medium to form a sheet of the medium;

simultaneously dispensing said polymer and a minor viscosity enhancing amount of a dry, particulate, inorganic, hydratable clay onto said sheet of the aqueous medium so that the polymer and clay particles are in close physical proximity and they form a thin, relatively wide curtain-like layer of discrete particles before contact with the aqueous medium to cause intimate admixture of the polymer and clay, the ratio of clay to polymer, by weight, being less than about 1 to 1.

3,909,422

METHOD FOR REMOVING ELEMENTAL SULFUR IN SOUR GAS WELLS

Thomas E. Sample, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 18, 1972, Ser. No. 315,950
Int. Cl. E21b *43/00, 37/00*
U.S. Cl. 252—8.55 B **6 Claims**

1. A process for preventing or removing solid sulfur deposits in an acid-gas or sour gas well, its attendant surface facilities

or the production formation by contacting the sulfur deposits with an aqueous solution of about 3 to about 50 percent (w/w) of an inorganic material reactive with sulfur selected from the group consisting of alkalies, sodium sulfite and sodium bisulfite and about 10 ppm nonionic surfactant wetting agent.

3,909,423

GELLED POLYMERS AND METHODS OF PREPARING SAME

James E. Hessert, and Richard L. Clampitt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 224,915, Feb. 9, 1972, Pat. No. 3,749,172. This application May 17, 1973, Ser. No. 361,236

Int. Cl.[2] E21B *43/16*

U.S. Cl. 252—8.55 D **22 Claims**

1. An aqueous medium, comprising water to which there has been added:

a water-thickening amount of a water-dispersible polymer selected from the group consisting of: polyacrylamides and polymethacrylamides wherein from 0.1 to about 14 percent of the carboxamide groups are hydrolyzed to carboxyl groups; crosslinked polyacrylamides and crosslinked polymethacrylamides wherein from 0.1 to about 14 percent of the carboxamide groups are hydrolyzed to carboxyl groups; copolymers of acrylamide with another ethylenically unsaturated monomer copolymerizable therewith, sufficient acrylamide being present in the monomer mixture to impart said water-dispersible properties to the resulting copolymer when it is mixed with water, and wherein from 0.1 to about 14 percent of the carboxamide groups are hydrolyzed to carboxyl groups; and mixtures of said polymers;

an amount of a water-soluble compound of a polyvalent metal wherein the valence state of the metal therein is capable of being reduced to a lower polyvalent valence state and which is sufficient to supply at least about 3×10^{-6} gram atoms of said polyvalent metal per gram of said polymer; and

an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state;

the initial total dissolved solids content of said first-mentioned water being at least about 40,000 ppm by weight.

11. A method for producing an aqueous gel, which method comprises:

thickening a brine having an initial total dissolved solids content of at least about 40,000 ppm by weight by adding thereto a thickening amount of a water-dispersible polymer selected from the group consisting of: polyacrylamides and polymethacrylamides wherein from 0.1 to about 14 percent of the carboxamide groups are hydrolyzed to carboxyl groups; crosslinked polyacrylamides and crosslinked polymethacrylamides wherein from 0.1 to about 14 percent of the carboxamide groups are hydrolyzed to carboxyl groups; copolymers of acrylamide with another ethylenically unsaturated monomer copolymerizable therewith, sufficient acrylamide being present in the monomer mixture to impart said water-dispersible properties to the resulting copolymer when it is mixed with water, and wherein from 0.1 to about 14 percent of the carboxamide groups are hydrolyzed to carboxyl groups; and mixtures of said polymers; and

causing gelation of the so-thickened brine by adding thereto an amount of a water-soluble compound of a polyvalent metal wherein the valence state of the metal therein is capable of being reduced to a lower polyvalent valence state and which is sufficient to supply at least about 3×10^{-6} gram atoms of said polyvalent metal per gram of said polymer, and an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state.

3,909,424

LUBRICANT COMPOSITIONS

Harold A. Clark, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed June 24, 1974, Ser. No. 482,297

Int. Cl.[2] C10M *5/00, 7/00*

U.S. Cl. 252—12 **10 Claims**

1. A lubricant composition comprising a homogeneous mixture of

a. a particulate solid lubricant and

b. a film-forming carrier consisting essentially of a dispersion of colloidal silica in a lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$ in which R is selected from the group consisting of alkyl radicals of 1 to 3 inclusive carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said carrier containing 10 to 50 weight percent solids consisting essentially of 10 to 75 weight percent colloidal silica and 25 to 90 weight percent of the partial condensate, said carried containing sufficient acid to provide a pH of 3.0 to 6.0 in the carrier.

3,909,425

LUBRICATING OIL COMPOSITION

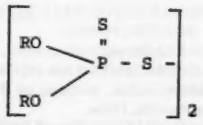
Wheeler C. Crawford, and Arthur W. Godfrey, both of Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed July 1, 1974, Ser. No. 484,474

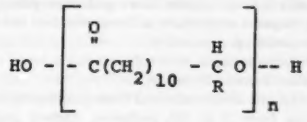
Int. Cl. C10m *1/48, 1/40*

U.S. Cl. 252—32.7 E **4 Claims**

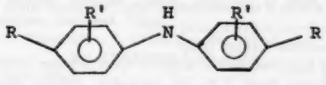
1. A lubricating oil composition comprising a major portion of a mineral oil of lubricating viscosity containing from about 1 to 2.5 weight percent of a basic barium sulfonate having a metal weight ratio from about 3 to 6, from about 0.1 to 0.5 weight percent of a zinc dialkyl dithiophosphate represented by the formula:



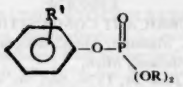
in which R is an aliphatic hydrocarbon radical having from about 1 to 8 carbon atoms, from about 0.5 to 1.5 weight percent of an estolide of 12-hydroxystearic acid represented by the formula:



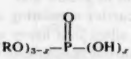
in which R is an alkyl group having from 2 to 6 carbon atoms and n is an integer having a value of 2 to 12, from about 0.1 to 1 weight percent of a sulfurized triisobutylene containing from about 30 to 40 weight percent sulfur, from about 0.1 to 1 weight percent of an alkylated diphenylamine represented by the formula:



in which R is an alkyl radical having from about 4 to 16 carbon atoms and R′ is hydrogen or an alkyl radical having from 1 to 4 carbon atoms, from about 1 to 2 weight percent of a triarylphosphate represented by the formula:



in which R is an aryl or an alkaryl radical having from 6 to 10 carbon atoms, and from about 0.1 to 1.0 weight percent of an alkyl phosphorus acid ester represented by the formula:



in which R is an alkyl radical having from 10 to 16 carbon atoms and x has a value of 1 or 2.

3,909,426

EXTREME PRESSURE GREASE COMPOSITION

Andrew G. Horodysky, and Henry Raich, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 3, 1973, Ser. No. 403,145
Int. Cl.[2] C10M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 252—17 **1 Claim**

1. A grease composition comprising a lubricating oil vehicle, a thickening amount of a lithium salt of 12-hydroxystearic acid and a lithium salt of an aliphatic dibasic acid, and synergistic extreme pressure proportions of calcium acetate and dibenzyl disulfide.

3,909,427

ADDITIVES FOR LUBRICANTS AND MOTOR FUELS

Sidney Schiff, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 6, 1974, Ser. No. 503,800
Int. Cl. C10m *1/40*
U.S. Cl. 252—33 **9 Claims**

1. A lubricating oil composition comprising a major proportion of a lubricating oil containing a small but effective amount, sufficient to impart increased detergency to said lubricating oil, of a dispersant additive which is the reaction product obtained upon reacting

a. a petroleum sulfonic acid with

b. an adduct formed from

1. at least one amine selected from primary monoamines having from 2 to 10, inclusive, carbon atoms, and pd yamines represented by the formula $H_2N[(CH_2)_xNH]_yH$ wherein x is an integer of from 2 to 6 and y is an integer of from 1 to 10, and

2. urea or thiourea.

5. A motor fuel comprising a major proportion of motor fuel containing a small but effective amount, sufficient to impart deposit-forming reduced tendencies to said motor fuel, of an additive which is the reaction product obtained upon reacting

a. a petroleum sulfonic acid with

b. an adduct formed from

1. at least one amine selected from primary monoamines having from 2 to 10, inclusive, carbon atoms, and polyamines represented by the formula $H_2N[(CH_2)_xNH]_yH$ wherein x is an integer of from 2 to 6 and y is an integer of from 1 to 10, and

2. urea or thiourea.

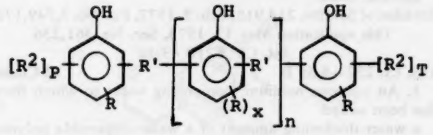
3,909,428

COMPOSITION AND METHOD

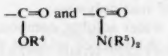
Donald L. DeVries, South Holland; Tai S. Chao, Homewood, and Bernard C. Vitchus, Palos Hills, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Oct. 11, 1972, Ser. No. 296,585
Int. Cl.[2] C10M *1/54*
U.S. Cl. 252—42.7 **28 Claims**

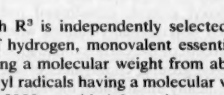
1. A lubricating oil composition which comprises a major amount of oil of lubricating viscosity; a minor amount of at least one metal phenate compound of a phenolic component having the following structure:



wherein each R is independently selected from the group consisting of monovalent essentially hydrocarbon radicals containing from about 3 to about 20 carbon atoms, each R′ is independently selected from the group consisting of divalent essentially hydrocarbon radicals containing from 1 to 5 carbon atoms and a carbonyl group, each R^2 is independently selected from the group consisting of non-interferring hydrocarbon radicals containing up to about 20 carbon atoms, non-interferring, non-hydrocarbon radicals



wherein R^5 is selected from the group consisting of hydrogen and monovalent essentially hydrocarbon radicals containing up to about 5 carbon atoms and mixtures thereof, n is an integer from 1 to about 6 and P, X and T are each integers from zero to 3, said metal being selected from the group consisting of alkali metal and alkaline earth metal; and a minor amount of at least one nitrogen-containing component selected from the group consisting of



wherein each R^3 is independently selected from the group consisting of hydrogen, monovalent essentially hydrocarbon radicals having a molecular weight from about 400 to about 5000, and acyl radicals having a molecular weight from about 400 to about 5000, provided that at least one R^3 has a molecular weight of at least about 400, and each R^4 is independently selected from the group consisting of divalent essentially hydrocarbon radicals containing from 1 to about 8 carbon atoms, and m is an integer from 1 to about 10 provided that an essentially hydrocarbon radical R^3 may be combined with at least one entity selected from the group consisting of a nitrogen atom, R^4, an essentially hydrocarbon radical R^3 and mixtures thereof to form at least a portion of the nitrogen-containing component into a heterocyclic ring, provided that said nitrogen-containing component includes at least one carbonyl group; wherein the combination of said metal phenate compound and said nitrogen-containing component is present in an amount sufficient to improve the oxidation stability of said composition.

3,909,429

CUTTING OIL COMPOSITION

Gifford George McClaflin, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 8, 1973, Ser. No. 339,269
Int. Cl.[2] C01M 1/48
U.S. Cl. 252—46.7 10 Claims

1. A non-aqueous cutting oil composition comprising (a) from about 55 to about 98 weight percent of a paraffinic or naphthenic base oil and (b) the combination of the following materials in the amounts specified:

	Percent by Weight
Sulfurized Sperm Oil	About 1 to about 25
Chlorinated Paraffin	About 0.5 to about 10
Trimer Acid	About 0.25 to about 5
Dialkyl Phosphite	About 0.1 to about 5

said composition being characterized further in that

a. said sulfurized sperm oil contains about 5 to about 15 weight percent sulfur,
b. said chlorinated paraffin contains about 30 to about 60 weight percent chlorine, and
c. said trimer acid contains at least 80 percent C_{54} tribasic acids.

3,909,430

LUBRICATING COMPOSITION

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 278,850, Aug. 7, 1972, Pat. No. 3,795,613. This application Aug. 27, 1973, Ser. No. 390,145
Int. Cl.[2] C10M 1/10
U.S. Cl. 252—49.9 10 Claims

1. A lubricating composition comprising an oil of lubricating viscosity and from 0.01 to 10 weight percent of a bisphosphoramide prepared by reacting phosphorus oxychloride with a C_2–C_{24} hydrocarbyl diol and a monoamine having the formula:

$$(R_1)_2\,NH$$

wherein R_1 is a C_1–C_{24} hydrocarbyl, the molar ratio of reactants being 3 to 5 mols of monoamine and 0.4 to 9.6 mols of diol for each mol of phosphorus oxychloride.

3,909,431

COOLANT-LUBRICANT COMPOSITION COMPRISING FLUOROCARBON-CYCLOHEXANONE MIXTURES

Francis J. Figiel, Boonton, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 80,200
Int. Cl.[3] C10M 1/30, 3/24
U.S. Cl. 252—54 10 Claims

1. Mixtures comprising a fluorocarbon which is trichloromonofluoromethane, dichloromonofluoromethane, monochloromonofluoromethane, dichlorotetrafluoroethane, tetrachlorodifluoroethane, 1,1,1-trichloro-2,2,2-trifluoroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, dibromotetrafluoroethane, dichlorotrifluoroethane, monochlorotrifluoroethane, or dichlorohexafluorocyclobutane, and cyclohexanone in which mixtures the weight percent of cyclohexanone does not exceed about 2.

3,909,432

PREPARATION OF SYNTHETIC HYDROCARBON LUBRICANTS

Stephen E. McGuire; John L. Riddle; Gene E. Nicks; Oliver Carl Kerfoot, all of Ponca City, Okla., and Carl D. Kennedy, Spartanburg, S.C., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 417,683, Nov. 26, 1974, abandoned. This application July 15, 1974, Ser. No. 488,622
Int. Cl.[2] C10M 1/16, 3/10, 5/08, 7/12
U.S. Cl. 252—59 18 Claims

1. A process for preparing a synthetic hydrocarbon lubricant composition, said composition consisting essentially of a major amount of di-long chain alkyl monocyclic aromatic hydrocarbon, wherein the long-chain alkyl groups are linear and contain six to about 18 carbon atoms and wherein the aryl moiety is phenyl, tolyl or xylyl, and a minor amount of trialkyl-substituted tetrahydronaphthalenes containing about 18 to about 42 carbon atoms total, said process comprising: (a) alkylating an alkylatable hydrocarbon feedstock comprising a mixture of a major amount of mono-long-chain alkyl monocyclic aromatic hydrocarbons, wherein the long-chain alkyl group and the aromatic moiety correspond to that of the di-long-chain alkyl aromatic hydrocarbons, and a minor amount of alkyl-substituted tetrahydronaphthalenes containing from 12 to 24 carbon atoms, with from about 0.1 to about 1.0 mole of linear mono-olefins, containing about six to about 18 carbon atoms, per mole of mono-long-chain alkyl aromatic hydrocarbons and alkyl-substituted tetrahydronaphthalenes, using as the catalyst from about 2 to about 10 weight percent aluminum chloride or aluminum bromide based on said linear mono-olefins, said alkylation being conducted at a temperature of from 50° to about 100°C and for a time in the range of about 5 to about 360 minutes, and (b) recovering the desired product by distillation.

3,909,433

LIQUID ELECTROPHOTOGRAPHIC DEVELOPING COMPOSITIONS

Yvan Karel Gilliams, Berchem; Jozef Leonard Van Engeland, St. Katelijne-Waver, and Noel Jozef De Volder, Edegem, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed June 28, 1973, Ser. No. 374,774
Claims priority, application United Kingdom, July 12, 1972, 32655/72
Int. Cl.[2] G03G 9/00
U.S. Cl. 252—62.1 38 Claims

1. A positive-working electrostatic liquid developer which will develop electrostatic charge patterns comprising an electrically insulating carrier liquid having a dielectric constant of less than 3 and a volume resistivity in excess of 10^9 Ohm.cm, resin-coated toner particles suspended in said carrier liquid, and an alkylated polymer of a heterocyclic N-vinyl monomer.

3,909,434

PHENOXY ORGANOSILICON COMPOUNDS AS DIELECTRIC FLUIDS

Paul L. Brown, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 7, 1974, Ser. No. 449,125
Int. Cl.[2] H01B 3/18, 7/00
U.S. Cl. 252—63.7 8 Claims

1. An article of manufacture consisting of an electrical device having at least two electrodes having between said electrodes a dielectric material consisting essentially of an organosilicon compound of the formula

in which

R is phenyl or t-butylphenyl,

R′ is methyl or phenyl, and

x is an integer from 1 to 30.

5. The article of claim **1** in which the organosilicon compound is dimethyldiphenoxy silane.

8. The article of claim **6** in which R is t-butylphenyl.

3,909,435

REACTION PRODUCT OF NAPHTHENIC ACIDS USEFUL AS INSULATING OIL

Isao Koga, Yokohama; Masahiro Fukui, Minamata; Takehiko Okamoto, Ichihara; Masaru Shimada, and Taizo Nakamura, both of Minamata, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed June 11, 1973, Ser. No. 368,791

Claims priority, application Japan, June 23, 1972, 47-62950; Apr. 23, 1973, 48-45861

Int. Cl. H01b *3/20*

U.S. Cl. 252—64 **2 Claims**

1. A composition useful as an insulating oil obtained by heating naphthenic acids alone or a mixture of naphthenic acids and a saturated aliphatic carboxylic acid having a carbon number of 2 to 18 or a saturated aliphatic aldehyde having a carbon number of 2 to 18, at a temperature of 200° – 700°C, under a pressure of 0.1 – 10 atm, and in the presence of, as a catalyst, an oxide selected from the group consisting of zirconium oxide, thorium oxide, lithium oxide, scandium oxide, yttrium oxide, alumina and oxides of rare earth elements of lanthanum and atomic numbers 58 – 71; subjecting the resulting oily product to neutralization treatment with an aqueous alkaline solution; and removing from the product thus treated, fractions having a boiling point of 150°C/100 mmHg or lower, by distillation.

3,909,436

DISINFECTANT COMPOSITION INCLUDING A SUBSTITUTED 2-HYDROXY BENZOPHENONE

Max Duennenberger, Frenkendorf, and Max Schellenbaum, Muttenz, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 53,026, July 7, 1970, abandoned. This application Apr. 16, 1973, Ser. No. 352,378

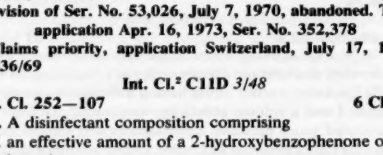
Claims priority, application Switzerland, July 17, 1969, 10936/69

Int. Cl.² C11D *3/48*

U.S. Cl. 252—107 **6 Claims**

1. A disinfectant composition comprising

1. an effective amount of a 2-hydroxybenzophenone of the formula



wherein Z_3 denotes an alkyl group with at most 2 carbon atoms or a chlorine or bromine atom, X_{13}, X_{14}, X_{15}, Y_7 and Y_8 each denote an alkyl group with at most 2 carbon atoms or a hydrogen, chlorine or bromine atom, and X_{16} denotes a hydrogen, chlorine or bromine atom, with the number of the alkyl groups being at most 3, and

2. soap or non-ionic, anionic, or cationic detergents.

3,909,437

NONCORROSIVE ACID, SOLVENT AND NONIONIC SURFACTANT COMPOSITION

George B. Alexander, and Norman F. Carpenter, both of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 18, 1973, Ser. No. 324,651

Int. Cl. C11d *7/50, 7/08*

U.S. Cl. 252—143 **6 Claims**

1. A composition comprising in percentages by weight the following ingredients:

a. about 8 to 12% sulfamic acid,

b. about 4 to 6% citric acid;

c. about 4 to 6% of a nonionic solvent for hydrocarbon residues which solvent is characterized as not producing turbidity at 75°F. when present in said composition,

d. about 0.095 to 0.15% of a soluble nonionic surfactant which surfactant is characterized as having a cloud point of at least about 90°F. and having a surface tension of about 32 dynes/cm. or less when present in an amount of 0.1% of said composition, and

e. the balance, water.

3,909,438

BLEACHING COMPOSITION

Yunosuke Nakagawa, Koshigaya; Shori Hakozaki, and Koitsu Sato, both of Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1973, Ser. No. 407,591

Claims priority, application Japan, Oct. 20, 1972, 47-104974

Int. Cl.² C11D *7/54, 7/18;* **D06L** *3/02*

U.S. Cl. 252—186 **7 Claims**

1. A bleaching composition comprising an inorganic peroxide capable of releasing hydrogen peroxide in aqueous solution and a compound of the formula

in which R is H or alkyl of one to 12 carbon atoms.

3,909,439

PROCESS FOR THE PRODUCTION OF ALUMINUM CHLOROHYDROXIDES

Luigi Rivola, and Bruno Notari, both of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Feb. 28, 1973, Ser. No. 336,753

Claims priority, application Italy, Mar. 1, 1972, 21252/72

Int. Cl.² C01F *7/00, 7/22, 7/56*

U.S. Cl. 252—187 R **2 Claims**

1. The process of producing aluminum chlorohydroxide represented by the formula: $Al_2(OH)_xCl_y$, wherein *x* and *y* range from 1 to 3.5 and from 5 to 2.5, respectively, which consists of reacting aluminum oxide or hydroxide with an amount of hydrochloric acid which is from (1/2.5) to (1/4) of the stoichiometric amount for obtaining aluminum trichloride, at a temperature in the range from 100°C to 160°C, and at a pressure in the range from 0.1 kg/cm² to 4 kg/cm² for a period of from 2 to 10 hours.

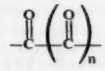
3,909,440

CHEMILUMINESCENCE FROM O-OXALYLHYDROXYL AMINE COMPOUNDS

Laszlo Joseph Bollyky, and Robert Henry Whitman, both of Fairfield, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 547,761, May 5, 1966, abandoned.
Filed Dec. 18, 1969, Ser. No. 886,395
Int. Cl.² C09K 3/00; C01B 13/00
U.S. Cl. 252—188.3 6 Claims

1. A composition intended to be reacted with a hydroperoxide to produce chemiluminescent light, said composition containing the ingredients (1) a compound of the formula where B is



n is an integer at least one, A is a hydroxylamine group, and G is selected from the group consisting of hydroxylamine, oxime, alcohol and amine groups, (2) an organic fluorescent compound and (3) a solvent for said ingredients.

2. A composition according to claim 1, in which the compound of the formula defined is selected from diphthalimido oxalate disuccinimido oxalate and the composition further comprises hydrogen peroxide.

3. A composition according to claim 1 where said solvent is water and an optional tetraalkylammonium salt additive is present.

3,909,441

COMPOSITION FOR FORMING ULTRAVIOLET ABSORBING FILTER LAYER

Yasushi Ohyama; Hideo Sumitani, and Sadayuki Miyazawa, all of Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sept. 27, 1972, Ser. No. 292,713
Claims priority, application Japan, Sept. 28, 1971, 46-75624
Int. Cl.² F21V 9/06, 9/16
U.S. Cl. 252—300 4 Claims

1. A composition for forming an ultraviolet absorbing filter layer comprising a dispersion in a hydrophilic binder, said hydrophilic binder being at least one member selected from the group consisting of gelatin, phthalic acid-modified gelatin, starch, hydroxypropyl starch, gum arabic, polyvinyl alcohol, polyacrylamide, polyvinyl pyrrolidone, a copolymer of styrene and maleic anhydride, a copolymer of vinyl methyl ether and maleic anhydride, hydroxyethyl cellulose, carboxymethyl cellulose, ethyl cellulose, and mixtures thereof, of a complex formed between a stilbene type fluorescent brightening agent containing an anionic group, which is diffusible in an aqueous medium, and a hydrophilic polymer selected from the group consisting of polyvinyl-benzyl-trimethyl-ammonium chloride, polyvinyl-benzyl-triethyl-ammonium chloride, polyvinyl-benzyl-morpholium-methyl chloride, polyvinyl-benzyl-cyclohexyl-ammonium chloride, polyvinyl-benzyl-picolinium chloride, poly-4-vinyl-benzyl-triethanol-ammonium chloride, the methyl chloride salt of methylamino diethanol monoester of polymethacrylic acid, the benzyl chloride salt of the dimethylamino-ethanol ester of polymethacrylic acid, and poly(N, N-dimethyl-3,5-methylene-piperidinium chloride.

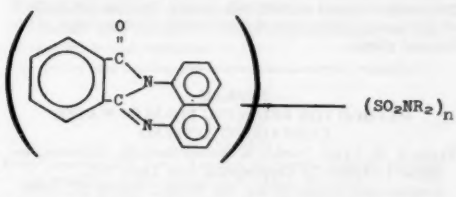
3,909,442

SOLUBILIZED ORANGE DYE (DIALKYLSULFONAMIDE DERIVATIVE)

Robert Jerome Tucker, Hackettstown, and Richard Spector, Kendall Park, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 7, 1974, Ser. No. 431,199
Int. Cl.² C08K 5/34; F21V 9/00
U.S. Cl. 252—300 2 Claims

1. A composition of matter comprising a plastic material selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, polyvinyl bromide, polyvinylidene bromide, polytrifluoroethylene, polytetrafluoroethylene, polyacrylonitrile, polystyrene and polymethyl methacrylate having incorporated therein an effective, light-filtering amount of dye compound of the formula:



wherein R is an alkyl group of from 1 to 5 carbon atoms and *n* is an integer of from 1 to 4.

3,909,443

CALCIUM LITHIUM SILICATE PHOSPHORS

Francis N. Shaffer, Towanda, Pa.; Dominic T. Palumbo, deceased, late of Towanda, Pa., and by Frances A. Palumbo, administratrix, Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 16, 1973, Ser. No. 388,941
Int. Cl.² C09K 11/12, 11/16, 11/34
U.S. Cl. 252—301.4 F 3 Claims

1. A crystalline luminescent composition of matter having a host matrix of Li_2O, CaO, and SiO_2 with part of said calcium being replaced by an activator, the proportions of Li_2O:CaO + activator:SiO_2 in said composition being selected from the group consisting of: a mole ratio of 1:1:1; and a composition wherein said Li_2O is present at from 20 to 33 1/3 mole percent, said CaO plus activator is present at from 25 to 40 mole percent and said SiO_2 is present at from 37.5 to 41 2/3 mole percent; said activator being lead and being present in an amount from 0.05 to 1.5 mole percent.

3. A crystalline luminescent composition of matter consisting essentially of Li_2O, CaO plus activator, and SiO_2 in a mole ratio of 1:1:1; said activator consisting of from 0.1 to 10.0 mole percent manganese and from 0.05 to 1.5 mole percent lead.

3,909,444

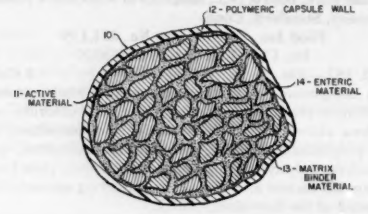
MICROCAPSULE

Jerrold L. Anderson, Dayton, and Thomas C. Powell, West Alexandria, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 5, 1971, Ser. No. 169,230
Int. Cl.² B01J 13/02
U.S. Cl. 252—316 9 Claims

1. A microcapsule consisting of an internal phase and a water soluble capsule wall permeable to aqueous solutions wherein the internal phase comprises an individual particle of a continuous matrix of water-soluble material and, distributed substantially evenly throughout the continuous matrix, a plurality of finely-divided particles of an active material and a plurality of finely-divided particles of enteric material and

wherein the water insoluble capsule wall permeable to aqueous solutions comprises a thin coating of water-insoluble



polymeric material substantially evenly covering the particle of continuous matrix material preventing disintegration of the internal phase.

3,909,445

METHOD FOR REDUCING FOAM IN WATER CONTAINING SYSTEMS

Franz J. M. Ernst, Wedel, Schleswig-Holstein, Germany, assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 20,861, March 18, 1970, abandoned. This application Sept. 21, 1972, Ser. No. 290,912

Int. Cl.[2] B01D *19/04*

U.S. Cl. 252—321 **16 Claims**

1. In a method for defoaming a system consisting essentially of water and an emulsifiable natural or synthetic oil, a wax, a glue or a detergent, the improvement whereby there is added to said system a polyethylene having a molecular weight of from about 500 to about 25,000, said polyethylene having been dissolved by heating in a vehicle selected from the group consisting of tetraisobutylene, mineral oils, fatty oils, fatty acids, emulsifiers selected from the group consisting of sodium petrol sulfonate, $CH_3—(CH_2)_{11\text{-}13}—(OCH_2—CH_2)_5OH$, $C_9H_{19}—C_6H_4—(OCH_2—CH_2)_5OH$ and mixtures thereof and the resulting solution cooled to at least 60°C such that the cooling rate is never less than about 4°C per minute nor more than about 20°C per minute, the resulting dispersion of polyethylene and vehicle containing from about 0.5 to about 15% of polyethylene and being added to said system in sufficient amount to provide from about 0.0002 to about 0.1% by weight of polyethylene therein.

3,909,446

METHOD OF MANUFACTURING HIGH QUALITY REDUCING GAS BY TWO STAGE REFORMING PROCESSES

Isuneo Miyashita, Kawasaki; Shoichiro Ozeki, Yokohama; Hiroaki Nishio, Kawasaki; Tosio Nayuki, Kawasaki; Tadashi Kobayashi, Kawasaki; Gyoichi Suzuki, Tokyo, and Tadashi Murakami, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1973, Ser. No. 343,218

Claims priority, application Japan, Mar. 31, 1972, 47-32495; Apr. 21, 1972, 47-39554; Apr. 21, 1972, 47-39555

Int. Cl.[2] C01B *2/28;* **C10K** *3/06*

U.S. Cl. 252—373 **4 Claims**

1. In a method of manufacturing reducing gas from hydrocarbons, the improvement which comprises the steps of thermally decomposing a hydrocarbon source selected from the group consisting of crude oil, a fuel oil, a heavy oil, coal and plastics in the presence of steam containing oxygen or in the presence of hydrogen thereby forming an intermediate gas, heating the intermediate gas to a temperature of from 150°C. to 1100°C., admixing the heated intermediate gas with gas heated to a temperature above 1100°C. and containing CO_2 and H_2O, and maintaining the resulting gas mixture at a temperature above 1100°C. thereby improving the quality of the gas mixture.

3,909,447

MIXTURES OF THIOPHOSPHATES, OXYGEN PHOSPHATES AND PYROPHOSPHATES

Derek Redmore, St. Louis, and Alfred E. Woodson, Festus, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

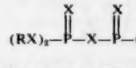
Filed July 17, 1972, Ser. No. 272,626

Int. Cl.[2] C02B *5/06;* **C23F** *11/10*

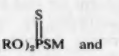
U.S. Cl. 252—389 A **8 Claims**

1. A composition of a mixture consisting essentially of

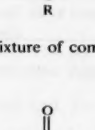
I. a mixture of different compounds, each having the formula



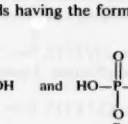
II. a compound or a mixture of compounds each having the formula



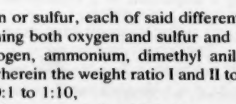
III. a compound or a mixture of compounds each having the formula



a compound or a mixture of compounds each having the formula



a mixture of compounds having the formulae



where

X is oxygen or sulfur, each of said different compounds in I containing both oxygen and sulfur and

M is hydrogen, ammonium, dimethyl aniline or tributylamine, wherein the weight ratio I and II to III ranges from about 10:1 to 1:10,

the mixture of compounds I and II being prepared by reacting an alkanol having 8 to 14 carbon atoms or a mixture of said alkanols, which alkanol or alkanols is or are oxyethylated with 0.5–10 moles of ethylene oxide, as R, with P_2S_5 first to form O,O-disubstituted dithiophosphoric acid or a mixture thereof until most of the P_2S_5 has dissolved and the evolution of H_2S has subsided and then continuing the reaction to shift the equilibrium in favor of converting dithiophosphoric acid or a mixture thereof to the pyrophosphates, each of said compounds or the mixture of said compounds III being prepared by reacting an alkanol having 8 to 14 carbon atoms or a mixture of said alkanols, which alkanol or alkanols is oxyethylated with 0.5–10 moles of ethylene oxide, as R, with P_2O_5 or polyphosphoric acid.

3,909,448

ANTIOXIDANT COMPOSITION

Brian McGuigan, Timperley; Richard John Dellar, Bolton, and William David Phillips, Poynton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 10, 1972, Ser. No. 296,451

Claims priority, application United Kingdom, Oct. 16, 1971, 48208/71

Int. Cl. B01j *1/16*

U.S. Cl. 252—402 9 Claims

1. An antioxidant composition obtained by a process which comprises oxidising a phenothiazine which is substituted by at least one alkyl group containing from 3 to 12 carbon atoms, at least one aralkyl group or at least one 1-alkylcycloalkyl group containing up to 7 carbon atoms, but wherein the 9-position on the molecule is free, by means of an oxidising agent selected from oxygen, a peracid, an alkali metal permanganate, chromic acid, an alkali metal chromate, a heavy metal tetracetate ferric chloride and lead dioxide.

TMO

3,909,449

METHOD FOR THE PRODUCTION OF ACTIVATED CARBON SPHERES

Hirosi Nagai, Chofu; Kunihiko Katori, Tokyo; Zenya Shiiki, Tokyo, and Yasuo Amagi, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo K.K., Nihonbashi and Toyo Boseki Kabushiki Kaisha, Osaka, both of, Japan

Filed Apr. 24, 1974, Ser. No. 463,602

Claims priority, application Japan, Apr. 26, 1973, 48-46661

Int. Cl.[2] B01D *15/00;* F01N *3/00*

U.S. Cl. 252—422 9 Claims

1. A method for the production of activated carbon spheres comprising:

melting a pitch;

mixing 100 parts of said pitch with 10–50 parts by weight of an aromatic solvent compatible with the pitch and 0.001 – 1 part by weight of a metal compound capable of catalyzing a reaction between said pitch and ammonia;

shaping the resulting mixture into spheres;

immersing said spheres in an organic solvent compatible with said aromatic solvent but lacking affinity for said pitch to extract the aromatic solvent from the spheres;

oxidizing the spheres to infusibilize them; and

contacting said spheres with ammonia gas or a gaseous mixture containing ammonia and a member selected from the group consisting of air, oxygen, steam, nitrogen and hydrogen at a temperature within the range of 550°–1000°C to effect a weight loss of at least 15%.

ALH

3,909,450

METHOD OF CATALYST MANUFACTURE

Mark J. O'Hara, Mt. Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 26, 1973, Ser. No. 428,280

Int. Cl.[2] B01J *27/24*

U.S. Cl. 252—438 7 Claims

1. In the manufacture of a catalyst for the hydrorefining of residual oils, said catalyst consisting essentially of a Group VIB metal oxide and a Group VIII metal oxide impregnated on a refractory inorganic oxide carrier material, the improvement of further impregnating a nitrogen-containing organic compound on said carrier material to deposit from about 0.3 to about 0.6 wt. % nitrogen thereon, and effecting thermal decomposition of said compound and adsorption of nitrogen on said carrier material, said nitrogen-containing compound being characterized by a basic dissociation constant of less than about 1×10^{-13} at 25°C.

3,909,451

DEHYDROGENATION CATALYST

Frederick C. Wilhelm, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 337,983, March 5, 1973, Pat. No. 3,851,003, which is a continuation-in-part of Ser. No. 102,059, Dec. 28, 1970, Pat. No. 3,725,304. This application Jan. 9, 1974, Ser. No. 432,001

Int. Cl. B01j *11/78*

U.S. Cl. 252—441 12 Claims

1. A catalyst preparation method comprising compositing catlytically effective amount of an alkali or alkaline earth metal oxide with a catalytic composite consisting essentially of a tin component in combination with a platinum component on a carrier materail, the catalytic composite being prepared by:

a. ipregnating a high surface area, porous caxrrier material with a solution of a complex chlorostannate (II) chloroplatinate anionic species, said solution being stabilized in contact with said carrier material with an aqueous halogen acid; and thereafter,

b. drying and calcing the impregnated carrier material.

3,909,452

CATALYSIS

Gary James Keith Acres, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed June 13, 1972, Ser. No. 262,363

Claims priority, application United Kingdom, June 16, 1971, 28283/71; June 16, 1971, 28314/71

Int. Cl. B01j *11/40, 11/06, 11/08*

U.S. Cl. 252—455 R 14 Claims

1. A catalyst for the oxidation of organic compounds which would otherwise cause atmospheric contamination consisting essentially of an inert rigid porous refractory ceramic honeycomb having applied thereto a first adherent catalytically active refractory metal oxide coating containing at least 50% by wweight of alumina in which one or more of the oxides titania, zirconia, hafnia, and thoria constitute at least 5% by weight of the refractory metal oxide and having a second coating of an alloy containing 1–50 wt% rhodium, from 0.01–25 wt% base metal selected from the group consisting of chromium, iron, cobalt, nickel, copper, silver, zinc, indium tin, and neodymium and balance platinum.

ALH

3,909,453

METHOD OF MANUFACTURING A CATALYST FOR THE HYDRO-REFINING OF RESIDUAL OILS

Mark J. O'Hara, Mt. Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 26, 1973, Ser. No. 428,562

Int. Cl. B01j *11/40, 11/06, 11/32*

U.S. Cl. 252—455 R 7 Claims

1. In the process for the manufacture of a catalyst comprising a Group VIII metal and a Group VIB metal impregnated on a refractory inorganic oxide carrier material, the improvement which comprises

a. initially impregnating the refractory inorganic oxide carrier material with an aqueous solution of a Group VIII metal compound;

b. drying the impregnated carrier material to contain less than about 50 wt. % volatile matter as determined by weight loss on ignition at 500° C.;

c. further impregnating the Group VIII metal compound-containing carrier material with molybdic acid dissolved in aqueous ammonium hydroxide; and

d. drying the resulting composite and calcining the same in an oxidizing atmosphere at a temperature of from about 500° to about 700° C.

3. The improvement of claim 1 further characterized in that said refractory inorganic oxide is alumina composited with silica in a weight ratio of from about 3:1 to about 9:1.

3,909,454

METHOD FOR ACTIVATION OF BENTONITES

Anat Azrad (Weisz), Batiah Makov Str. 14, Rehovoth, Israel

Filed Feb. 25, 1974, Ser. No. 445,660
Claims priority, application Israel, Mar. 13, 1973, 41757
Int. Cl.² B01J 29/06
U.S. Cl. 252—455 R 7 Claims

1. A method for the activation of bentonite which comprises treating the bentonite with 0.25-10% by weight of bentonite of an organic polymer and an aqueous alkaline solution, both known, the improvement being the incorporation into the treated bentonite of an amount of 0.01–10% by weight from the pretreated bentonite of a heavy metal salt selected from salts of Fe, Ni, Zn, Co, Cr and Mn and drying the activated bentonite mass at a temperature not higher than 400°C.

3,909,455

CATALYST AND PROCESS FOR MAKING SAME

Norman B. Rainer, and Peter Allen Wilson, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed May 1, 1973, Ser. No. 356,094
Int. Cl. B01j 11/22
U.S. Cl. 252—466 J 10 Claims

1. A room temperature catalyst capable of converting carbon monoxide to carbon dioxide in the presence of ambient oxygen comprising an alumina support having a surface area of about 100 to about 400 square meters per gram and from about 0.5 to about 15 percent by weight cobalt adsorbed on said alumina in the form of a blue cobalt aluminate spinel having labile molecular oxygen, said catalyst containing substantially no moisture.

3,909,456

CATALYST FOR PROMOTING REDUCTION OF NITROGEN OXIDES CONTAINED IN EXHAUST GASES

Kiyoshi Numagami, Yokohama; Toshiki Okuyama, Fujisawa, and Tadanari Kato, Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Apr. 12, 1973, Ser. No. 350,499
Claims priority, application Japan, Apr. 15, 1972, 47-36867
Int. Cl.² B01J 23/40
U.S. Cl. 252—472 5 Claims

1. A method for preparing a catalyst for reducing nitrogen oxides contained in exhaust gases, said method comprising the steps of: forming a monolithic carrier in a desired form; immersing said carrier in an aqueous solution containing a ruthenium salt so as to support ruthenium in an amount of 0.02 – 0.85% by weight, and a salt of at least one metal selected from the group consisting of palladium, platinum and rhodium so as to support the at least one metal in an amount of 0.001 to 0.7% by weight; removing the immersed carrier from the solution; exposing the carrier to a flow of ammonia gas; drying the carrier; and calcining the resultant carrier in a flow of hydrogen gas at a temperature of 300°C to 1,000°C.

3,909,457

SUPPORTED CATALYST FOR THE OXIDATION OF O-XYLENE OR NAPHTHALENE INTO PHTHALIC ANHYDRIDE

Wilhelm Friedrichsen, Ludwigshafen, and Otto Goehre, Wilhelmsfeld, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 6, 1973, Ser. No. 422,569
Claims priority, application Germany, Dec. 12, 1972, 2260615
Int. Cl.² B01J 23/04
U.S. Cl. 252—476 4 Claims

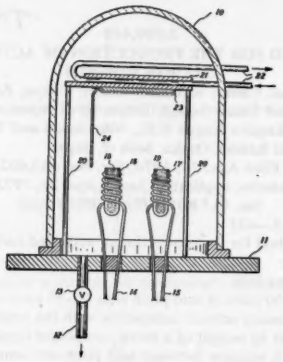
1. A supported catalyst for the oxidation of o-xylene or naphthalene into phthalic anhydride comprising an inert nonporous carrier and applied thereto a thin layer of active material which contains from 1 to 40% by weight of vanadium pentoxide and from 60 to 99% by weight of anatase and which has a vanadium pentoxide content of from 0.05 to 4% by weight based on the supported catalyst wherein the catalytically active material contains from 0.01 to 0.15% by weight, based on the anatase, of sodium or potassium oxide devoid of sulfur.

3,909,458

PHOTOSENSITIVE VITREOUS LAYER COMPRISING BISMUTH AND SELENIUM

John C. Schottmiller; Francis W. Ryan, both of Penfield, N.Y., and Charles Wood, Sycamore, Ill., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 321,194, Jan. 5, 1973, which is a continuation-in-part of Ser. No. 798,750, Feb. 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 674,267, Oct. 10, 1967, Pat. No. 3,627,573, which is a continuation-in-part of Ser. No. 550,215, May 16, 1966, abandoned. This application May 6, 1974, Ser. No. 467,037
Int. Cl.² H01B 1/02
U.S. Cl. 252—501 2 Claims



1. A semiconducting element which includes a vitreous layer comprising bismuth and selenium, in which the bismuth comprises about 2.0 to 4.0 atomic percent, with the balance substantially selenium.

3,909,459

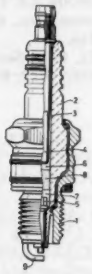
COMPOSITION RESISTOR SUITABLE FOR SPARK PLUGS AND METHOD OF MAKING THE SAME

Karl-Hermann Friese, and Heinz Geier, both of Leonberg, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 6, 1973, Ser. No. 394,678
Claims priority, application Germany, Sept. 15, 1972, 2245404
Int. Cl.² H01B 1/06
U.S. Cl. 252—509 5 Claims

1. A composition resistor suitable for incorporation in a spark plug consisting of a fused mixture consisting essentially of carbon black in a proportion between 0.3 and 2.5% by weight, a borosilicate glass, an inorganic filler and an organic binder, the borosilicate glass constituting the major portion of the composition and the filler being metal oxide having a thermal expansion coefficient in excess of 5.5 parts per million per °C and being present in a quantity approximating the amount thereof required to raise the average thermal expansion coefficient to a value within the TEC range common to ceramic materials, and the organic binder being present in a proportion of the order of magnitude of 6% by weight, in which, further, said glass consists essentially of between 35 and 65% by weight of silicon dioxide, between 20 and 55% by weight of boric oxide, between 0.5 and 10% by weight of

lithium oxide, having an aggregate sodium oxide and potassium oxide content, if any, not exceeding 2% by weight, with or without one or more of the following constituents in the following ranges of percentage by weight:



Constituent	% by weight
CaO	0.15%
SrO	0.15%
BaO	0.10%
MgO	0.15%
Al_2O_3	0.15%
PbO	0.5%

3,909,460

DETERGENT COMPOSITIONS CONTAINING DIOXOLANES AS SURFACTANTS AND THEIR PREPARATION

David Ross McCoy, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 847,729, Aug. 5, 1969, abandoned. This application Aug. 10, 1973, Ser. No. 387,426

Int. Cl.[2] C11D *3/065*

U.S. Cl. 252—532 **14 Claims**

1. A detergent composition consisting essentially of:

a. from about 0.01 to 20 parts by weight of a water-soluble derivative of 2,2-di-n-alkyl-4-methylol-1,3-dioxolane wherein the alkyl groups of the dioxolane contain 5 to 29 carbon atoms, said dioxolane having a molecular weight ranging from about 185 to 260, said water-soluble derivative being selected from the group consisting of the monosulfate of 2,2-dialkyl-4-methylol-1,3-dioxolane, the ammonium salt of the monosulfate of 2,2-di-n-alkyl-4-methylol-1,3-dioxolane, the ethoxylates of 2,2-dialkyl-4-methylol-1,3-dioxolane wherein the average number of moles of ethylene oxide contained in said dioxolane ranges from about 5 moles to 16 moles,

b. from about 40 to 80 parts by weight of a builder

c. a residuum of inert ingredients.

3,909,461

PROCESS FOR PREPARING POWDERED CLEANING AND DETERGENT COMPOSITION

Vincent A. Culmone, Clifton, and Thaddeus J. Kaniecki, Pompton Plains, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed July 9, 1973, Ser. No. 377,679

Int. Cl.[2] C11D *3/065*

U.S. Cl. 252—539 **8 Claims**

1. A process for incorporating pine oil in a dry, powdered cleaning or detergent composition containing various solid components which comprises first contacting the pine oil with a powdered silica sorbing material having a particle size of from about 0.007 to 0.05 microns and a surface area of from about 95 to about 600 square meters per gram, the amount of pine oil being up to about two times by weight as the amount of silica, whereby the pine oil and the sorbing material form a dry, free flowing, non-caking powder and combining the resulting dry, free flowing, non-caking powder with the other various components to form a dry, free flowing, non-caking powdered cleaning or detergent composition comprising pine oil.

3,909,462

NOVEL ODORANT AND/OR FLAVORANT

Bernhard Gubler, Pfaffikon, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Sept. 1, 1972, Ser. No. 285,689

Claims priority, application Switzerland, Sept. 6, 1971, 13017/71

Int. Cl.[2] C07C *103/32*

U.S. Cl. 260—562 R **1 Claim**

1. N-Phenyl-N-methyl-2-ethylbutyric acid amide.

3,909,463

GRAFTED BLOCK COPOLYMERS OF SYNTHETIC RUBBERS AND POLYOLEFINS

Paul F. Hartman, Wayne, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 780,165, Nov. 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 690,758, Dec. 15, 1967, abandoned. This application Feb. 2, 1972, Ser. No. 228,418

Int. Cl.[2] C08L *23/28, 9/06, 61/16*

U.S. Cl. 260—2.5 F **22 Claims**

1. A process for producing a grafted block copolymer composition which comprises forming an intimate mixture comprising:

A. from about 40 to 99 parts by weight of an unsaturated olefin polymer selected from the group consisting of polyethylene, polypropylene and polybutene-1;

B. correspondingly from about 1 to about 60 parts by weight of an unsaturated, uncured synthetic rubber selected from the group consisting of butyl rubber, copolymers of butadiene and styrene containing 50 to 95% butadiene, copolymers of butadiene and acrylonitrile containing 40 to 95% butadiene, polybutadiene, and terpolymers of ethylene, propylene and a diolefin; and

C. at least 0.3% by weight of said olefin polymer and synthetic rubber of a bifunctional phenol aldehyde condensate where the functional groups are hydroxy or halogen in ortho positions, and

heating said mixture at a temperature between about 250°F. to about 425°F. to form a copolymer in which the synthetic rubber is grafted to said olefin polymer whereby said composition is free of substantial amounts of crosslinked rubber.

3,909,464

FLAME RETARDANT FLEXIBLE POLYANETHANE FOAM CONTAINING ALUMINA TRIHYDRATE

Carlos J. Anorga, San Pedro, and Samuel Chess, Palos Verdes Estates, both of Calif., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 20, 1974, Ser. No. 452,752

Int. Cl.[2] C08G *18/76*

U.S. Cl. 260—2.5 AJ **11 Claims**

1. A flame retardant flexible polyurethane foam consisting essentially of the product of reaction, under foam producing conditions, of:

a. a polyisocyanate mixture which contains from 5 percent to 95 percent by weight of toluene diisocyanate, and from 95 percent to 5 percent by weight of polymethylene polyphenyl polyisocyanate containing from about 40 percent to about 70 percent methylenebis (phenyl isocyanate), the remainder of said polymethylene polyphenyl polyisocyanates having functionality higher than 2.0;

b. a polyether polyol having an equivalent weight from about 500 to about 2500 and a functionality from about 2.0 to about 4.0;
c. from about 2 to about 20 percent by weight, based on weight of final foam, of antimony oxide;
d. from about 1 to about 15 percent by weight, based on weight of final foam, of a polyhalogenated aromatic compound; and
e. from about 1 to about 15 percent by weight, based on weight of final foam, of alumina trihydrate.

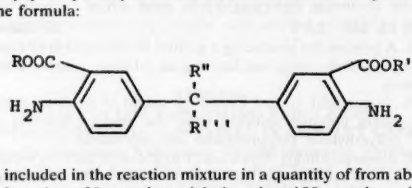
3,909,465

PROCESS FOR THE PRODUCTION OF RIGID FOAM RESINS WHICH CONTAIN PREDOMINANTLY ISOCYANURATE RING STRUCTURES

Rolf Wiedermann, Bergisch-Gladbach; Johannes Blahak, Cologne, and Franz Hermann Prager, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Filed Dec. 28, 1973, Ser. No. 429,244
Claims priority, application Germany, Jan. 12, 1973, 2301408
Int. Cl.² C08J *9/00;* **C08G** *18/28*
U.S. Cl. 260—2.5 AW **3 Claims**

1. A rigid foam resin comprising predominantly isocyanurate ring structures prepared by a process which comprises reacting an aromatic polyisocyanate in the presence of an isocyanate trimerization catalyst, a blowing agent, and, a polyhydroxyl compound, characterized in that a compound of the formula:



is included in the reaction mixture in a quantity of from about 0.2 to about 20 parts by weight based on 100 parts by weight of polyisocyanate, wherein R and R′ represent C_1–C_{18} alkyl radicals, C_4–C_{14} cycloalkyl radicals, or C_6–C_{14} aryl radicals, wherein R″ and R‴ represent hydrogen atoms or C_1–C_6 alkyl radicals or wherein the grouping

represents C_4–C_6 cycloalkyl radicals, wherein the amount of polyhydroxyl compound used is such that a sufficient quantity of isocyanate groups remain for the trimerization reaction, and wherein from 50 to 100% of said remaining isocyanate groups are polymerized to isocyanurate groups.

3,909,466

ADHESIVE COMPOSITIONS OF NCO-TERMINATED PREPOLYMER AND RUBBER

Yutaka Matsui, Shizuoka; Seiji Kazama, Hyogo; Masamitsu Nakabayashi, and Koji Kobayashi, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed June 28, 1972, Ser. No. 267,151
Claims priority, application Japan, July 5, 1971, 46-49474
Int. Cl.² C08L *75/06, 75/08, 15/00*
U.S. Cl. 260—3 **17 Claims**

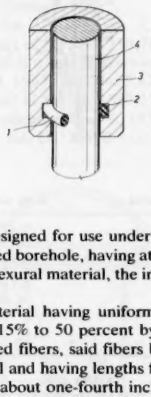
1. An adhesive composition which comprises an NCO-terminated prepolymer prepared by reacting ω,ω′-diisocyanatodimethylcyclohexane with an active hydrogen-containing compound having a molecular weight of about 60 to about 500 in a ratio of NCO groups to OH groups of not less than about 1.5 and a conjugated diene rubber, wherein the weight ratio of the NCO-terminated prepolymer to the rubber is about 1/10 to about 1/200.

3,909,467

DOWNHOLE TOOL

John Allen Tatum, Houston, Tex., assignor to The Randolph Company, Houston, Tex.

Filed Aug. 22, 1973, Ser. No. 390,438
Int. Cl.² C08K *7/02, 7/12;* **E21B** *17/10, 37/02*
U.S. Cl. 260—8 **10 Claims**



1. In a device designed for use under high pressure conditions in a liquid-filled borehole, having at least one component of gas-permeable flexural material, the improvement comprising:
said flexural material having uniformly distributed therethrough from 15% to 50 percent by weight of randomly oriented flocked fibers, said fibers being of non-thermoplastic material and having lengths from about one sixty-fourth inch to about one-fourth inch.

3,909,468

METHOD OF PRODUCING DECOMPOSABLE RESIN MOLDINGS

Kenjiro Tanaka; Tadao Shigeta; Nobuyuki Kikkawa; Noriharu Kumura, and Katsuhiro Ono, all of Chiba, Japan, assignors to Idemitsu Kosan Company Ltd., Japan

Filed Sept. 20, 1973, Ser. No. 398,995
Claims priority, application Japan, Sept. 30, 1972, 47-98137; Nov. 27, 1972, 47-117933
Int. Cl.² C08L *89/00*
U.S. Cl. 260—8 **3 Claims**

1. A method of preparing decomposable resin moldings which comprises the step of molding a mixture of polyolefin and yeast with heating at a temperature sufficient to mold said mixture.

3,909,469

POLYETHYLENIMINE ADHESIVE

Adolph Miller, 340 E. 64th St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 299,634, Oct. 20, 1972, abandoned. This application Sept. 16, 1974, Ser. No. 506,039
Int. Cl.² C08L *1/28*
U.S. Cl. 260—15 **8 Claims**

1. An adhesive composition suitable for strongly bonding a plastic film onto a substrate which comprises,
a substantially non-gelling water solution of polyethylenimine and a water-soluble lower aldehyde in an amount ranging by weight from about 1% to 15% polyethylenimine and about 0.2% to 5% aldehyde, said solution also containing about 0.015% to 6% by weight of a water-soluble aliphatic carboxylic acid containing up to 6 carbon atoms, said amount being based on the carboxyl radical of said acid, the amount of said acid being effective when added during the formulation of said composition before the addition of said lower aldehyde to inhibit gel formation of said adhesive composition due to the subsequent addition of said aldehyde,
the amount of acid employed increasing with increased amounts of polyethyleimine over said ranges,

said composition also containing by weight 0.01% to 1% of thickener selected from the group consisting of hydroxyethylcellulose, polyvinyl alcohol and methyl cellulose, about 0.03% to 2% of curing agent selected from the group consisting of melamine-formaldehyde and urea-formaldehyde and about 0.005% to 0.1% of a defoaming agent.

3,909,470

THERMOSETTING ADHESIVE COMPOSITIONS EXTENDED WITH CELLULOSIC PAPER MILL SLUDGES

Alan L. Lambuth, Boise, Idaho, and William Montgomery Hearon, Portland, Oreg., assignors to Boise Cascade Corporation, Boise, Idaho

Division of Ser. No. 406,002, Oct. 12, 1973. This application Sept. 23, 1974, Ser. No. 508,226

Int. Cl.² C08L *1/02*

U.S. Cl. 260—17.3 **13 Claims**

1. A thermosetting resinous adhesive composition comprising:

a. at least one thermosetting resin of the class consisting of the thermosetting ureaformaldehyde resins, and melamine-formaldehyde resins,

b. an extender for the resin comprising an aqueous cellulosic pulp hydrated to a freeness of not over 400 cc. Canadian Standard Freeness and having a content of cellulosic fibers a preponderant proportion of which having maximum lengths of not over about ⅛ inche,

the resin and extender being used in relative proportions of from about one to about fifty parts extender for each one hundred resins, parts being expressed as parts by weight on a dry solids basis, and

d. water used in amount sufficient to impart to the composition a viscosity of from about 1,000 to about 12,000 centipoises.

3,909,471

SURFACE COATINGS OR PLASTICS COLORED WITH AN ANTHRAQUINONEOXADIAZOLE

Manfred Ruske, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

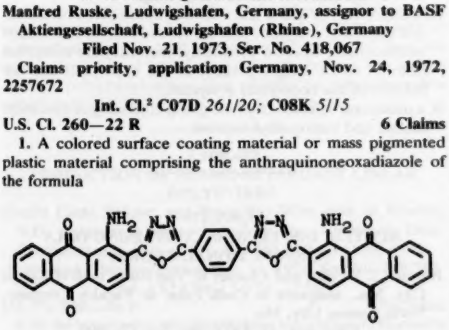
Filed Nov. 21, 1973, Ser. No. 418,067

Claims priority, application Germany, Nov. 24, 1972, 2257672

Int. Cl.² C07D *261/20;* **C08K** *5/15*

U.S. Cl. 260—22 R **6 Claims**

1. A colored surface coating material or mass pigmented plastic material comprising the anthraquinoneoxadiazole of the formula



in finely divided pigment form dispersed in said coating or plastic material which is a polymer selected from the group consisting of polyvinyl chloride, vinyl chloride copolymers, polystyrene, styrene copolymers, polyacrylates, acrylonitrile copolymers, polyolefins, polyamides, polycarbonates, silicone resins, amino resins based on urea or melamine and formaldehyde, epoxy resins, polyurethane resins and alkyd resins.

3,909,472

PLASTICS ADDITIVES IN THE FORM OF SUBSTANTIALLY HOMOGENEOUS GRANULES AND PROCESS FOR MAKING THE SAME

Julius F. Fischer, Ferguson, and Daniel F. Scully, Woodson Terrace, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed May 14, 1973, Ser. No. 360,036

Int. Cl.² C08L *91/00, 91/06, 93/00;* **C09K** *3/00*

U.S. Cl. 260—23 XA **12 Claims**

1. A method for preparing a granular and substantially homogeneous polyfunctional additive for vinyl-based polymers which comprises precipitating a water-insoluble saponaceous salt from an aqueous medium having dispersed therein at least one other microingredient additive.

3,909,473

CIS-1,4-POLYISOPRENE RUBBER COMPOSITION HAVING IMPROVED MECHANICAL PROPERTIES

Takayuki Okamura; Shobu Minatono; Junnosuke Yamauchi, and Kazuhisa Yamauchi, all of Ibaragi, Japan, assignors to Kuraray Co. Ltd., Kurashiki, Japan

Filed Nov. 30, 1973, Ser. No. 420,628

Claims priority, application Japan, Dec. 2, 1972, 47-120961

Int. Cl.² C08L *91/00;* **C08K** *3/22;* **C08F** *8/10*

U.S. Cl. 260—23.7 M **3 Claims**

1. An unvulcanized rubber composition having a high green strength and being useful for the preparation of a vulcanizate, said composition comprising a modified cis-1,4-polyisoprene rubber having a bound maleic anhydride content of from 0.03 to 2.5 moles per 100 recurring units of isoprene nonomer in the rubber polymer, and rubber compounding ingredients contaning sulfur as a vulcanizing agent for said rubber, 0.5 to 3.0 parts by weight based on 100 parts by weight of said rubber, of a hydroxide of a metal belonging to Group II A of the Periodic Table, 2 to 8 parts by weight of zinc oxide based on 100 parts by weight of said rubber and stearic acid in an effective amount for the control of scorch.

3,909,474

ROAD SURFACE STABILIZATION

Alfred E. Borchert, Cherry Hill, N.J.; Albert C. Condo, Newtown Square Felix C. Gzemski, Glen Mills; John F. McGrogan, Philadelphia, Pa., and Benjamin C. Wilbur, Williamstown, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 184,304, Sept. 27, 1971, abandoned. This application Jan. 24, 1974, Ser. No. 436,246

Int. Cl.² C08L *95/00*

U.S. Cl. 260—28 **16 Claims**

1. An aqueous emulsion which cures to a composition having excellent low temperature flexibility and ductility for the stabilization of the surface aggregate particles of roadways located in Arctic and sub-Arctic regions and subjected to extremely low winter temperatures which composition is not deleterious to the thermal insulation properties of said roadway and which inhibits the transfer of said aggregate particles to surfaces adjacent said roadway with consequent damage to said surfaces which comprises a bituminous composition comprising an air oxidized crude oil residuum having an initial boiling point above about 234°F. at one atmosphere and about 3 to 20 parts of a polyurethane per 100 parts of crude oil residuum produced in situ in said bituminous composition from a polyol having a substantially hydrocarbon backbone structure and which is soluble in said crude oil residuum and an aliphatic, aromatic or alicyclic diisocyanate in the presence of a sufficient amount of catalyst to effect formation of urethane polymer, the ratio of polyol hydroxyl groups to total isocyanate groups being greater than 1, said polyurethane being chemically bound to said air oxidized residuum.

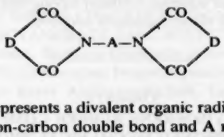
3,909,475

MOULDABLE COMPOSITION BASED ON THERMOSETTING RESIN

Charles Schneider, Vernaison, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Nov. 5, 1973, Ser. No. 412,962
Claims priority, application France, Nov. 8, 1972, 72.39515
Int. Cl.² C08L 79/08
U.S. Cl. 260—29.1 SB 9 Claims

1. In a mouldable composition which consists essentially of (*a*) a prepolymer, having a softening point from 50 to 220°C. produced from an N,N'-bis-imide of the general formula:

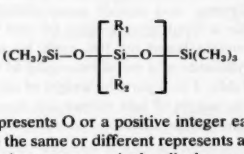


(I)

in which D represents a divalent organic radical containing an olefinic carbon-carbon double bond and A represents a divalent radical possessing 2 to 30 carbon atoms, and a polyamine of the general formula:

$R(NH_2)_x$ (II)

in which x is an integer at least equal to 2 and R represents an organic radical of valency x, 0.55 to 25 mols of bis-imide being used per molar $—NH_2$ group provided by the polyamine and (*b*) filler, the improvement wherein the composition consists essentially of a homogeneous mixture of (*a*) and (*b*) with (*c*) a mixture of, based on the weight of the prepolymer, about 0.1 to 10% by weight of a radical-type initiator and about 0.05 to 10% by weight of an organopolysiloxane oil having the formula:



in which *n* represents O or a positive integer each R_1 radical, which may be the same or different represents an alkyl radical with 1 to 4 carbon atoms, a vinyl radical or a phenyl radical, the alkyl and phenyl radicals being either unsubstituted or substituted by at least one halogen atom or cyano group; and R_2 is as defined under R_1 or represents a hydrogen atom or a trimethylsiloxy group and having a viscosity between 50 and 5,000 cSt at 20°C. or of a mixture comprising a said oil and an organopolysiloxane resin consisting essentially of trimethylsiloxy units and SiO_2 units, the ratio of the number of methyl groups to the number of silicon atoms being between 0.8/1 and 1.5/1, the proportion of resin in said mixture being up to 50% by weight of the mixture.

3,909,476

TEMPORARY SOIL RELEASE RESINS APPLIED TO FABRICS IN LAUNDERING

Harry Creston Mandell, Jr., Wayne, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 171,362, Aug. 12, 1971, Pat. No. 3,782,898. This application Oct. 12, 1973, Ser. No. 405,996
Int. Cl.² C08L 33/02, 33/06; C11D 7/08; D06M 15/08
U.S. Cl. 260—29.6 H 5 Claims

1. The laundry composition consisting essentially of water, an acrylic resin at a concentration within the range of 0.25 to 3.0 parts by weight per 5000 parts of weight of the laundry composition selected from one or more of the group consisting of polyacrylic acid, polymethacrylic acid and copolymers of acrylic acid, methacrylic acid and methyl methacrylate with alkylesters of acrylic acid and methacrylic acid said alkyl groups being limited from 1 to 4 carbon atoms, and one or more acid liberating compounds selected from the group consisting of ammonium fluosilicate, magnesium fluosilicate, sodium fluosilicate, zinc fluosilicate, sodium bifluoride, ammonium bifluoride, ammonium chloride, acetic acid, fluosilicic acid and hydrofluoric acid in an amount to give the composition a pH within the range of 4 to 6.5

3,909,477

WARP-SIZING COMPOSITIONS AND YARNS SIZED THEREWITH

Norman L. Madison, Midland; Victor E. Meyer, Midland; Gerald P. Beaumont, Midland, and Alfred R. Nelson, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 27, 1973, Ser. No. 374,209
Int. Cl.² C08F 15/40
U.S. Cl. 260—29.7 H 12 Claims

1. A textile yarn sizing composition comprising (a) an aqueous colloidal dispersion containing (1) a film-forming copolymer of from about 1 percent to about 10 percent of an α,β-ethylenically unsaturated carboxylic acid and the balance of an essentially water-insoluble, ethylenically unsaturated monomer composition and (2) a six-membered carbocyclic compound having two vicinal carboxyl groups which is soluble in aqueous alkaline media in an amount sufficient to provide redispersibility of the copolymer residue obtained by drying the aqueous colloidal dispersion at a pH of from about 7 to about 14 and (b) a lubricant; said sizing composition also containing from about 0.5 percent to about 7 percent, based on the copolymer weight, of a surfactant.

3,909,478

PLASTICIZED COPOLYMERS

Gerard Riess, Mulhouse Dornach, France; Jacques Periard, Fribourg, Switzerland, and Albert Banderet, Strasbourg, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Continuation of Ser. No. 230,479, Feb. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 831,984, June 10, 1969, abandoned. This application Nov. 13, 1973, Ser. No. 415,359
Claims priority, application France, June 11, 1968, 68.154609
Int. Cl.² C08K 5/01, 5/05, 5/11, 5/12
U.S. Cl. 260—31.4 R 2 Claims

1. A composition of matter comprising:

A. a copolymer of a first and a second monomer, wherein the first monomer is styrene and the second monomer is methyl methacrylate, wherein the methyl methacrylate comprises from 57 to 61 weight percent of the copolymer and the balance of the copolymer is styrene,

B. a plasticizer selected from the group consisting of diisobutyl azelate and butoxyethyl stearate.

3,909,479

ACRYLIC DISPERSIONS CONTAINING ONLY NONFUNCTIONAL GROUPS

Howard J. Wright, and Charles R. Van Horn, both of Kansas City, Mo., assignors to Cook Paint & Varnish Company, North Kansas City, Mo.

Filed Aug. 16, 1971, Ser. No. 176,369
Int. Cl.² C08K 5/01
U.S. Cl. 260—33.6 UA 4 Claims

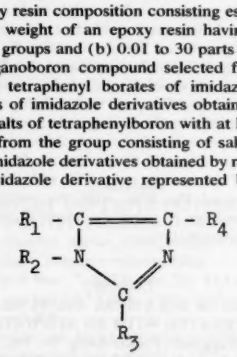
1. A process for creating a stable acrylic dispersion consisting of copolymerizing a monomer mixture of 22% styrene, 26% butyl methacrylate, 10% alpha methyl styrene, 20% acrylonitrile, and 22% ethyl methacrylate, in the presence of a solution of alkylated melamine-formaldehyde condensate dissolved in an essentially aliphatic hydrocarbon.

3,909,480
EPOXY RESIN COMPOSITIONS CONTAINING TETRAPHENYLBORATES OF IMIDAZOLES

Masatzugu Ogata, Hitachi; Ritsuro Tada, Mito; Motoyo Wajima, Hitachi; Masahiro Kitamura, Hitachi; Hiroshi Suzuki, Hitachi; Mikio Sato, Hitachi, and Etuzi Kubo, Shimodate, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., Japan

Filed Mar. 27, 1974, Ser. No. 455,403
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—37 EP **17 Claims**

1. An epoxy resin composition consisting essentially of (a) 100 parts by weight of an epoxy resin having at least two vicinal epoxy groups and (b) 0.01 to 30 parts by weight of at least one organoboron compound selected from the group consisting of tetraphenyl borates of imidazole and tetraphenylborates of imidazole derivatives obtained by reacting alkali metal salts of tetraphenylboron with at least one member selected from the group consisting of salts of imidazole and salts of imidazole derivatives obtained by reacting imidazole or an imidazole derivative represented by the general formula:



wherein R_1, R_2, R_3, and R_4, which may be same as or different from one another, are selected from the group consisting of hydrogen, alkyl groups having 1 to 20 carbon atoms, alkenyl groups having 2 to 6 carbon atoms, acyl groups having 2 to 7 carbon atoms, aryl groups having 6 to 12 carbon atoms, cycloalkyl groups having 6 to 12 carbon atoms, cycloalkenyl groups having 6 to 12 carbon atoms, aldehyde group, carboxyl group, cyano group, and nitro group, with acids.

3,909,481
OXIDATIVELY STABLE MODIFIED POLYPHENYLQUINOXALINE RESIN

Roscoe A. Pike, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 18, 1974, Ser. No. 533,915
Int. Cl.[2] C08L *61/20*
U.S. Cl. 260—37 N **10 Claims**

1. An oxidatively stable resin consisting essentially of the cyclicized reaction product of polyphenylquinoxaline polymer and polyquinoxaline polymer containing 1–10%, by weight, of a dispersed finely divided particulate filler selected from the group consisting of silica, alumina and graphite, the weight ratio of polyphenylquinoxaline polymer to polyquinoxaline polymer ranging from approximately 1.9 to 19.

3,909,482
PRODUCTION OF FLAME-RETARDANT LINEAR POLYESTERS

Gerald Costa Najour, and Peter Ray Witt, both of Kinston, N.C., assignors to Emery Industries, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 301,812, Oct. 30, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 449,780
Int. Cl.[2] C08G *51/56, 17/04*
U.S. Cl. 260—40 P **7 Claims**

1. In the production of polyethylene terephthalate filaments by a continuous process of feeding dimethyl terephthalate and ethylene glycol components with catalyst to ester interchange means and reacting the components to form di-β-hydroxyethyl terephthalate monomer, feeding the monomer to a prepolymerizer and polymerizing the monomer to form low molecular weight prepolymer, feeding the prepolymer to a finish polymerizere and completing the polymerization to form fiber-forming polymer, and feeding the polymer to a spinning machine and meltspinning the polymer into filaments; the improvement for producing flame-retardant filaments of excellent whiteness, wherein the improvement comprises continuously adding to said di-β-hydroxyethyl terephthalate monomer a molten stream of 2,2-bis-[4-(2-hydroxyethoxy)-3,5-dibromophenyl] propane in an amount which provides from about 4 to about 5 mole percent based on glycol terephthalate structural units present in the copolyester produced, and up to 400 parts per million of an optical brightener, conducting the polymerization within a holdup time of 2.5 hours at temperatures from about 273° to about 290° C. to form fiber-forming copolyester, and melt-spinning the copolyester into filaments.

3,909,483
TACK FREE POLYMERIZABLE POLYESTER COMPOSITIONS

Raymond R. Hindersinn, Lewiston, and Jeffrey E. Selley, Amherst, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 260,937, June 8, 1972, abandoned. This application Apr. 9, 1974, Ser. No. 459,749
Int. Cl.[2] C08L *67/06*
U.S. Cl. 260—40 R **21 Claims**

1. A polymerizable polyester composition of components comprising
   1. a carboxy group terminated saturated polyester of a diol and a dicarboxylic compound having a molecular weight of about 2000 to about 25,000, an acid number of about 2 to about 40 and a hydroxyl number of less than about 10,
   2. an α,β-ethylenically unsaturated polyester of a diol and a α,β-ethylenically unsaturated dicarboxylic compound, and
   3. an α,β-ethylenically unsaturated monomer copolymerizable with said unsaturated polyester;

   said saturated polyester being present in the amount of at least about 5 parts by weight and said unsaturated polyester being present in the amount of at least about 30 parts by weight per 100 parts by weight of the mixture of polyesters and said copolymerizable monomer.

3,909,484
FLAME RETARDANT REINFORCED BONDED ARTICLES AND BONDING COMPOSITIONS THEREFOR

Alfred N. Beavon, New Castle, Pa., assignor to Universal-Rundle Corporation, New Castle, Pa.

Filed Apr. 16, 1973, Ser. No. 351,158
Int. Cl.[2] C08L *67/06*
U.S. Cl. 260—40 R **6 Claims**

1. A flame retardant filled curable polyester resin bonding compostion which after curing liberates non-burning products under combustion conditions, comprising
   a. a mixture comprising a normally combustible condensation product polyester resin and a polymerizable vinyl monomer, said polyester resin being a condensation product of a composition selected from the group consisting of unsaturated polycarboxylic acids and anhydrides, and a polyol, said mixture comprising from about 40 to about 60 percent by weight of the bonding composition;
   b. aluminum hydrate in an amount comprising from about 40 to about 50 percent by weight of the bonding composition; and
   c. a trialkyl phosphate wherein the alkyl groups are selected from the group comprising of unsubstituted and halogen substituted alkyl groups, said trialkyl phosphate comprising at least about 3 percent by weight of the bonding composition.

3,909,485

FLAME-RESISTANT GLASS-FIBER REINFORCED POLYTETRAMETHYLENE TEREPHTHALATE RESIN COMPOSITION

Masafumi Hongo; Ryoji Handa, and Kazumasa Kamada, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

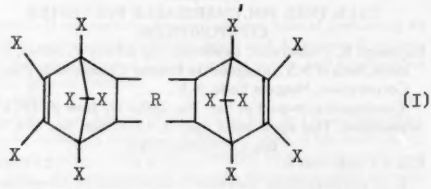
Filed July 10, 1974, Ser. No. 487,252

Claims priority, application Japan, July 11, 1973, 48-77410; Apr. 30, 1974, 49-47574

Int. Cl.[2] C08K *3/22, 5/02;* **C08L** *63/02, 67/02*

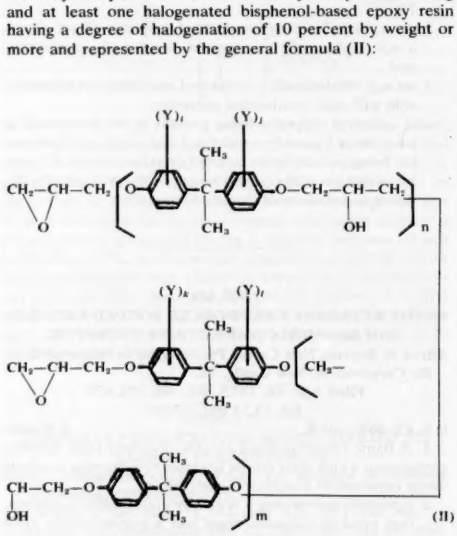
U.S. Cl. 260—40 R **8 Claims**

1. A flame-resistant, glass-fiber-reinforced resin composition comprising glass-fiber-filled polytetramethylene terephthalate, a flame retardant, and antimony trioxide characterized in that said flame retardant consists of at least one compound represented by the general formula (I):



(I)

wherein X represents a chlorine or bromine atom and R represents a residue for connecting the left and right ring structures to form a tetrahydrofuran, cyclopentane, cyclooctane, endomethylenecyclohexane, or endomethylenehydroindan ring and at least one halogenated bisphenol-based epoxy resin having a degree of halogenation of 10 percent by weight or more and represented by the general formula (II):



(II)

wherein Y represents a chlorine or bromine atom, each of i, j, k, and *l* represents a number of from 1 to 4, and (n + m) represets a mean degree of polymerization ranging from 0 to 10; the proportion of the compound of the formula (I) ranges 3 to 30 parts by weight per 100 parts by weight of polytetramethylene terephthalate; and the proportion of said halogenated epoxy resin of the formula (II) is 0.3 to 25 parts by weight per 100 parts by weight of polytetramethylene terephthalate; the weight ratio of the flame retardants of the formulas (I) and (II) to antimony trioxide being 0.25 – 6.00 : 1.

3,909,486

METHOD OF HALOGENATING THERMOPLASTIC POLYOLEFINS

Ray Clarence Lever, Fairfield, and Edward Vincent Wilkus, Trumbull, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed June 28, 1973, Ser. No. 374,521

Int. Cl. C08f *45/04*

U.S. Cl. 260—42 **18 Claims**

1. A method of halogenating polyolefin compositions comprising the steps of: mixing particles of thermoplastic polyolefin material with particulate filler while melting surface portions of the polyolefin particles within an atmosphere comprising vaporous halogen and thereby reacting the halogen with the melting polyolefin while combining the filler with said melting surface portions of the polyolefin particles, removing the resultant combined filler and molten halogenated polyolefin from the particles by the mixing action and thereby exposing underlying portions of the polyolefin particles to said mixing of the particles with the particulate filler, said melting and reacting of the melting polyolefin with the halogen, and said combining of the filler with the melting polyolefin whereby the particles of polyolefin material are subjected to a progressive halogenation.

3,909,487

DRY BLENDS OF POLYMERS AND FUMED SILICON DIOXIDE TREATED WITH AN ALIPHATIC SILANE

Marion Glen Waggoner, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 28, 1973, Ser. No. 419,890

Int. Cl. C08f *45/00*

U.S. Cl. 260—42.15 **9 Claims**

1. A dry blend coating material for glass which consists essentially of a copolymer of α-olefins of the formula R—CH=CH_2, where R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms, and α,β-ethylenically unsaturated carboxylic acids having from 3 to 8 carbon atoms, said copolymer having from 0 to 90% of the carboxylic acid groups ionized by neutralization with metal ions, said copolymer being a copolymer of the α-olefins and the unsaturated carboxylic acid in which the carboxylic acid groups are randomly distributed over all molecules and in which

1. the α-olefin content of the copolymer is at least 50 mol percent, based on the α-olefin-acid copolymer,
2. the unsaturated carboxylic acid content of the copolymer is from 0.2 to 25 mol percent, based on the α-olefin-acid copolymer, and
3. any other monomer component optionally copolymerized in said copolymer is monoethylenically unsaturated, and said metal ions having an ionized valence of from one to three inclusive when the unsaturated acid is a monocarboxylic acid and an ionized valence of one when the unsaturated acid is a dicarboxylic acid and said metal ions being selected from the group consisting of uncomplexed and complexed metal ions, and 0.1 to 0.5% by weight, based on the weight of the copolymer, of a hydrophobic, aliphatic silane-treated, fumed silicon dioxide prepared by treating $SiCl_4$ in a combustible gas to form nonporous silica particles and contacting said particles with a silane compound to yield a silane-treated surface on the silica particles.

3,909,488

VINYL PLASTISOL COMPOSITIONS

Sebastian A. Consoli, Lawrence, Mass., assignor to Tillotson Corporation, Needham, Mass.

Filed Mar. 6, 1974, Ser. No. 448,718

Int. Cl.[2] C08K *5/11;* **C08J** *3/20*

U.S. Cl. 260—42.49 **12 Claims**

1. A vinyl plastisol composition comprising a vinyl polymer, a lower alkyl ester of a fatty acid in an amount sufficient to

coat said polymer when in powder form, a plasticizer for said polymer and a particulate filler in an amount of between about 300 and 2500 weight percent based upon the weight of said polymer, the concentration of the ester being between about 5 to 15 weight percent, based upon the weight of filler, said ester being added to a mixture of said polymer and filler prior to adding said plasticizer to said polymer thereby to greatly reduce the rate at which the plasticizer subsequently added to said mixture solvates the vinyl polymer and thereby to effect homogeneous dispersion and retention of said filler in the vinyl plastisol composition.

3,909,489

POLYESTERS AND COPOLYESTERS HAVING IMPROVED FLAME RETARDANCY

Douglas D. Callander, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

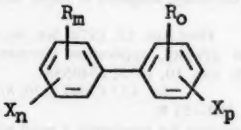
Filed Nov. 7, 1973, Ser. No. 413,479
Int. Cl.[2] C08K 3/38, 5/03
U.S. Cl. 260—45.7 R 9 Claims

5. A flame retardant, high molecular weight linear polyester or copolyester composition consisting of (A) a polyester or copolyester having an intrinsic viscosity of at least 0.4 as measured on a 0.1 gram sample at 30°C. in a 60/40 phenol/s-tetrachloroethane solvent and (B) a synergistic mixture consisting of (1) from 1 to 10 percent by weight, based on the weight of the polyester or copolyester, of halogen atom as at least one polyhalogenated aromatic compound selected from the group consisting of halogenated benzene compounds of the formula

(I)

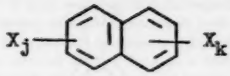
where R is selected from the group consisting of hydrogen atom and alkyl radicals containing from 1 to 3 carbon atoms, X is selected from the group consisting of bromine and chlorine atoms, *m* and *n* are integers where m ranges from 0 to 3 and the sum of *m* and *n* is 6, halogenated biphenyl compounds of the formula

(II)



where R is selected from the group consisting of hydrogen atom, alkyl radicals containing from 1 to 4 carbon atoms and halogen substituted alkyl radicals containing from 1 to 4 carbon atoms in which said halogen atoms are selected from the group consisting of bromine and chlorine, X is selected from the group consisting of bromine and chlorine, *m*, *n*, *o* and *p* are integers where *m* and *o* ranged from 0 to 3 and the sum of *m* and *n* is 5 and the sum of *o* and *p* is 5 and halogenated naphthalene compounds of the formula

(III)



where X is selected from the group consisting of bromine and chlorine atoms and *j* and *k* are integers ranging from 2 to 4 and the sum of *j* and *k* 4 and (2) from 0.1 to 3.0 percent by weight, based on the weight of the polyester or copolyester, of at least one compound selected from the group consisting of alkali metal tetrafluoroborates.

3,909,490

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1973, Ser. No. 429,163
Int. Cl.[2] C08K 5/42
U.S. Cl. 260—45.7 S 9 Claims

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of an additive selected from the group consisting of the metal salts of substituted and unsubstituted sulfonic acids of aromatic sulfides, and mixtures thereof, wherein said metal salts are selected from the group consisting of alkali metals and alkaline earth metals, and mixtures of these metal salts, and said substituent on the metal salt of the substituted sulfonic acids of aromatic sulfides is selected from the group consisting of electron withdrawing radicals and mixtures of electron withdrawing radicals.

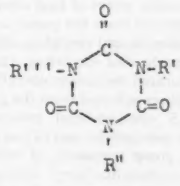
3,909,491

HYDROXYPHENYLALKYLENEYL ISOCYANURATE/THIOPHOSPHITE COMBINATIONS AS STABILIZERS FOR ORGANIC MATERIALS

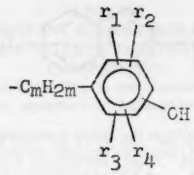
Jack C. Gilles, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 15, 1973, Ser. No. 406,344
Int. Cl.[2] C08K 5/34, 5/49
U.S. Cl. 260—45.8 NT 10 Claims

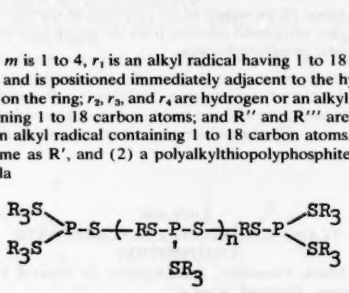
6. A composition comprising (A) an organic material subject to oxidative and/or thermal degradation, and (B) as the only stabilizer, a combination of (1) a hydroxyphenylalkylenyl isocyanurate of the formula



wherein R' is a hydroxyphenylalkyleneyl radical of the formula



where m is 1 to 4, r_1 is an alkyl radical having 1 to 18 carbon atoms and is positioned immediately adjacent to the hydroxyl group on the ring; r_2, r_3, and r_4 are hydrogen or an alkyl radical containing 1 to 18 carbon atoms; and R'' and R''' are hydrogen, an alkyl radical containing 1 to 18 carbon atoms, or are the same as R', and (2) a polyalkylthiopolyphosphite of the formula



wherein $n = 0$ to 9; R is selected from the group consisting of an alkylene radical of 1 to about 20 carbon atoms, an alkoxyalkyl or alkylthioalkyl radical containing 2 to about 20 carbon atoms, a cycloalkylene radical of 5 to 6 carbon atoms in the ring, and an arylene radical of 6 to 10 carbon atoms; R_3 is an alkyl radical of 1 to about 20 carbon atoms; said hydroxyphenylalkyleneyl isocyanurate compound used at a level of from about 0.01 part to about 5 parts by weight per 100 parts by weight of organic material, said thiophosphite compound used at a level of from about 0.01 part to about 5 parts by weight per 100 parts by weight of organic material, and said hydroxyphenylalkyleneyl isocyanurate compound used in about a 10:1 to 1:10 weight ratio to the thiophosphite compound.

3,909,492

STABILIZATION OF VINYL CHLORIDE POLYMERS WITH MIXTURES OF ORGANOTIN MERCAPTIDES AND MERCAPTOESTERS

William A. Larkin, Morristown, and Robert C. Ringwood, Jr., Sewaren, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 137,624, April 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 709,890, March 4, 1968, abandoned. This application Nov. 22, 1974, Ser. No. 526,321

Int. Cl.[2] C08G *6/00*

U.S. Cl. 260—45.75 S **5 Claims**

1. A halogen-containing polymer composition stabilized against the deteriorative effect of heat comprising a halogen-containing resin selected from the group consisting of homopolymers of vinyl chloride and vinylidene chloride and copolymers of vinyl chloride and vinylidene chloride with other ethylenically unsaturated monomers and effective amounts of (1) a primary stabilizer selected from the group consisting of monobutyltin-S,S',S''-tris-(iso-octyl mercaptoacetate), and butyltin tris-(lauryl mercaptide) and (2) an auxiliary stabilizer selected from the group consisting of tributyltin-S-iso-octyl mercaptoacetate, triphenyltin lauryl mercaptide, and triphenyltin thiophenate; with the proviso that the weight ratio of primary stabilizer to auxiliary stabilizer is between about 1:2 and 7:1.

3,909,493

ALIPHATIC ESTERS OF CARBOXYMETHENE- AND CARBOXYETHENETHIOSUCCINIC ACID

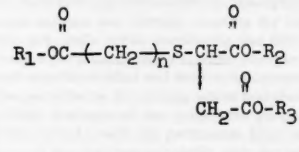
Jack C. Gilles, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 191,491, Oct. 21, 1971, abandoned. This application Aug. 24, 1973, Ser. No. 391,220

Int. Cl.[2] C08K *5/11, 5/36;* **C08L** *23/06, 23/12*

U.S. Cl. 260—45.7 S **3 Claims**

1. A composition comprising a poly-α-monoolefin polymer, about 1 part by weight of a compound of the formula



wherein n = 1 or 2, and R_1, R_2, and R_3 are alkyl groups containing 8 to 24 carbon atoms and from 0.01 part to about 5 parts by weight of 1,3,5-tris(3,5-di-t-butyl-4-hydroxybenzyl-)isocyanurate, all weights based upon 100 parts by weight of polymer.

3,909,494

STABLE PREPARATIONS OF REACTION PRODUCTS OF EPOXIDES, FATTY AMINES AND DICARBOXYLIC ACIDS

Rosemarie Toepfl, Basel; Heinz Abel, Reinach, and Arthur Maeder, Therwil, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 151,127, June 8, 1971, Pat. No. 3,769,365. This application May 14, 1973, Ser. No. 360,252

Claims priority, application Switzerland, June 9, 1970, 8621/70; Jan. 22, 1971, 981/71

Int. Cl.[2] C08G *73/16*

U.S. Cl. 260—47 EP **30 Claims**

1. A stable composition, which comprises the free-carboxyl-group-containing reaction product produced in the presence of an organic solvent by the reaction of one epoxide equivalent of an epoxide which contains at least two 1, 2-expoxide groups per molecule, (b) a primary higher-molecular fatty amine with 12 to 24 carbon atoms and (c) an aliphatic, saturated dicarboxylic acid with at least 7 carbon atoms, the equivalent ratio of hydrogen bonded to amine nitrogen to carboxylic acid groups being 0.1:1 to 1:0.55.

3,909,495

RESOL RESINS PREPARED FROM DIHYDROXYDIISOPROPYLBENZENE

Dieter Freitag, Krefeld; Hans Rudolph, Krefeld-Bockum; Clemens Niehaus, and Rolf Küchenmeister, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 15, 1974, Ser. No. 461,216

Claims priority, application Germany, Apr. 19, 1973, 2320009; Aug. 10, 1973, 2340558

Int. Cl.[2] C08G *8/20, 8/24*

U.S. Cl. 260—51 R **14 Claims**

1. A process for producing a resol which comprises condensing formaldehyde or a formaldehyde donor with a condensation resin at a pH greater than 7, said condensation resin having a phenolic OH-group content of from 6.2 to 8.5% by weight and having been obtained by reacting a mixture consisting of α,α'-dihydroxy-1,3-diisopropylbenzene and α,α'-dihydroxy-1,4-diisopropylbenzene in a proportion by weight of from 70:30 to 30:70 with phenol, o-cresol, m-cresol, p-cresol or a cresol mixture in the presence of an acid of phosphorus and then neutralizing said acid of phosphorus by the addition of a sodium or potassium hydroxide solution.

3,909,496

PREPARATION OF 2,5-DIBROMOTEREPHTHALATE UNSATURATED POLYESTER

Fred K. C. Kwan, La Grange, Ill., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 307,045, Nov. 16, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,260

Int. Cl.[2] C08G *63/68*, *63/56*

U.S. Cl. 260—75 H 1 Claim

1. The method of forming a fire retardant polyester comprising a polyhydric alcohol, 2,5-dibromoterephthalic acid and an alpha, beta-ethylenically unsaturated dicarboxylic acid, wherein said 2,5-dibromoterephthalic acid provides from about 5 to 90 percent of the acyl equivalents and said alpha, beta-ethylenically unsaturated dicarboxylic acid provides from 10 to 95 percent of the acyl equivalents, which comprises the steps of reacting under polyesterification conditions in a first stage substantially all of said alpha, beta-ethylenically unsaturated dicarboxylic acid with polyhydric alcohol and in a second stage substantially all of said 2,5-dibromoterephthalic acid.

3,909,497

SOLID POLYMERS THERMALLY DEGRADABLE TO FLOWABLE COMPOSITIONS

Dale G. Hendry, Menlo Park; Marion E. Hill, Palo Alto, both of Calif., and Howard M. Peters, Falls Church, Va., assignors to Stanford Research Insitute, Menlo Park, Calif.

Filed Apr. 12, 1974, Ser. No. 460,379

Int. Cl.[2] C08G *18/00*

U.S. Cl. 260—77.5 A 10 Claims

1. A process for forming a flowable composition in situ by thermal degradation of a solid polymer, said process comprising:

1. providing a solid polymer formed by the action of heat, radiation or a chemical curing agent on a resin which is not fully cured, said agent or said resin or both containing a plurality of heat sensitive skeletal segments,

the composition of said segments in said polymer being such that at least half of those present at any time will have been cleaved after 1 hour at a temperature T_D at which essentially all other chemical bonds in said polymer remain unbroken after 1 hour,

2. heating said polymer, at a temperature (T_H) which is not higher than T_D, until the polymer is degraded to a mass which is flowable at or below T_H,

said polymer being formed at a temperature less than T_D, and said heating being carried out essentially in the absence of any materials reactive with said mass.

3,909,498

PROCESS FOR PREPARING GRANULAR POWDERED POLYAMIDE

Wilhelmus P. Wolvers, Sittard, and Jean M. M. Warnier, Urmond, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed July 13, 1973, Ser. No. 378,938

Int. Cl.[2] C08G *69/18*

U.S. Cl. 260—78 L 5 Claims

1. In a process for preparing a granular or powdered polyamide by the solution polymerization of a lactam or mixture of lactams in an inert solvent by means of an anionic catalyst and a promoter at a temperature below the melting point of the polyamide which is to be formed, the improvement comprising the presence, dissolved or distributed in the solvent, of at least one modifier selected from the group consisting of alcohols containing from 6 – 30 carbon atoms and carboxylic esters derived from aliphatic and aryl-aliphatic alcohols containing 5 – 30 carbon atoms, and a monovalent or polyvalent carboxylic acid containing 5 – 30 carbon atoms, during said polymerization, wherein the amount of modifier is about 20 to about 200 mole per cent, calculated with respect to the amount of promotor.

3,909,499

CLOSED REDUCTION FURNACE

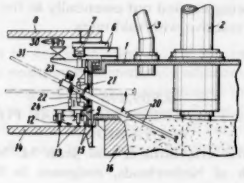
Heinz Stark, Essen, Germany, assignor to Demag Aktiengesellschaft, Germany

Filed Aug. 5, 1974, Ser. No. 494,479

Claims priority, application Germany, Aug. 8, 1973, 2340104

Int. Cl.[2] F27D *1/02*; F27B *14/12*

U.S. Cl. 13—35 18 Claims



1. A closed reduction furnace having a furnace shell and a furnace roof equipped with gas-tight electrode conduits, exhaust pipes and charging devices and poking devices traveling around the furnace, characterized in that

a. said furnace roof includes a stationary element and at least one rotary element;

b. means sealing the fixed element with respect to the rotary element; and

c. gas-tight means mounting said poking device upon said rotary element.

3,909,500

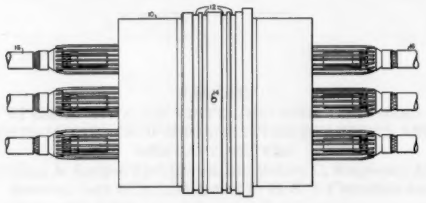
ELECTRICALLY SHIELDED CABLE SEAL ASSEMBLY AND PENETRATION COMBINATION

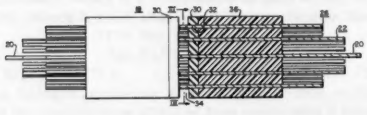
Albert Bereza; Renzo L. Korner, and Milton W. Franke, all of Horseheads, N.Y., assignors to Westi..ghouse Electric Corporation, Pittsburgh, Pa.

Filed May 30, 1974, Ser. No. 474,552

Int. Cl. G21c *13/02*; H01b *17/26*

U.S. Cl. 174—11 R 8 Claims





1. An electrically shielded cable seal assembly for connecting two sections of a shielded cable comprising;

a longitudinally extending signal cable;

a flexible, foraminous, conductive shielding means through which resinous sealant may be readily passed, radially disposed about and spaced from the signal cable;

two spaced apart electrically insulating resinous sealant members formed of in situ hardened resinous sealant disposed about the signal cable and filling the spacing between the signal cable and the shielding means, and encompassing the shielding means, with a leak monitoring spacing maintained between the spaced apart sealant members which each form a seal about and along the signal cable and the shielding means, said signal cable and shielding means extending through said sealant members and continuing as the signal cable and shielding means on either side thereof.

3,909,501

HOLLOW CONDUCTOR POWER CABLE

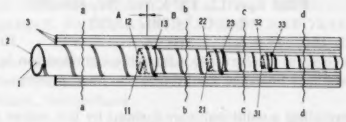
John Normann Johnsen, Oslo, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 9, 1974, Ser. No. 468,628

Claims priority, application Norway, May 22, 1973, 2097/73

Int. Cl. H01b *7/34*, *5/10*

U.S. Cl. 174—15 C 9 Claims



1. A power cable having varying thermal conditions along a route comprising a plurality of outer longitudinal electrical wire conductors disposed about a hollow central duct, said conductors having a substantially constant outer diameter along the route, said duct and conductors having an inner diameter which increases and decreases with the thermal conditions along said route, and said conductors having a cross-sectional dimension between inner and outer diameters which correspondingly increases and decreases therewith.

3,909,502

COLUMN FOR ELECTRICAL SUPPLY CABLES

Guy H. Lacan, le Mesnil-le-Roi, France, assignor to Technilec, Gonesse, France

Filed July 11, 1974, Ser. No. 487,797

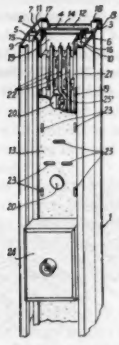
Claims priority, application France, July 19, 1973, 73.26488

Int. Cl.[2] H02G *3/04*

U.S. Cl. 174—48 10 Claims

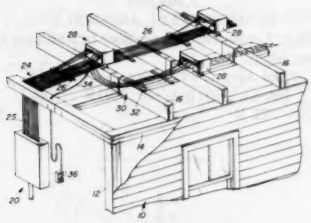
1. A distribution and connection column for electrically conductive cables, comprising a beam having in section a central web, and two pairs of flanges extending on two opposite sides of the central web, the median zone of the web being formed as a U-section having flanges which are parallel to the flanges of the beam, the lateral extension of the flanges of the U-section being less than that of the flanges of the beam, and the beam thus forming two separate longitudinally extending

casings for receiving said cables, the first casing being located inside the U-section, and the second casing being defined



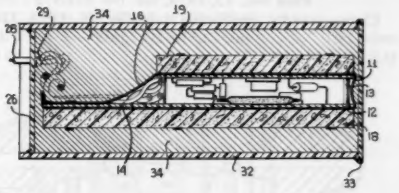
partly by the web and one pair of flanges of the beam, and partly by the U-section.

3,909,503
WIRING SYSTEM
Joseph W. Bird, Scituate, Mass., assignor to Ralph Pill Electric Supply Company, Boston, Mass.
Filed Oct. 10, 1972, Ser. No. 296,287
Int. Cl.² H02G 3/00
U.S. Cl. 174—48 **15 Claims**



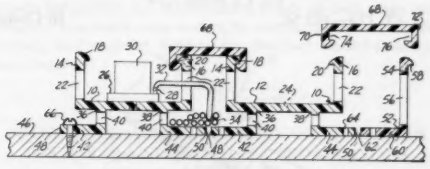
1. A power distribution system for a building comprising:
a load center for receiving AC power;
a multi-wire cable coupled to said load center and extending along a predetermined length of said building;
at least one distribution means including a connector board having first terminals coupled to wires of said cable;
a plurality of lengths of interconnecting cable, each contained in a retaining means connected at preselected positions in said building;
said distribution means having second terminals having one end of said interconnecting cable connected thereto;
and a utilization outlet connected to the other end of said interconnecting cable;
wherein said connector board includes a plurality of sandwiched insulating boards and a plurality of connector strips having contacts disposed therealong.

3,909,504
RUGGEDIZED PACKAGE FOR ELECTRONIC COMPONENTS AND THE LIKE
Sidney Browne, Falls Church, Va., assignor to Carrier Telephone Corporation of America, Inc., Falls Church, Va.
Filed Nov. 5, 1973, Ser. No. 412,752
Int. Cl. H04k 5/06
U.S. Cl. 174—52 PE **9 Claims**



1. A ruggedized weather proof component package comprising:
a hollow polyvinylchloride casing sealed at its joints by a polyvinylchloride weld;
an integral sub-assembly including a polyethylene bag disposed inside said casing, said bag being heat sealed and containing the packaged components; and
plastic material disposed inside said casing and filling the volume therein which is unoccupied by said integral sub-assembly;
wherein the components being packaged include electrical apparatus which requires wire leads to be passed from inside said polyethylene bag to outside said package, said package further comprising:
polyethylene shielding about the wire leads extending through said polyethylene bag, said polyethylene shielding being heat sealed to said bag at the point of passage therethrough.

3,909,505
MODULAR ELECTRICAL COMPONENT MOUNTING ASSEMBLY WITH INTEGRAL WIRING DUCT
Philip W. Taylor, Howell, Mich., assignor to Taylor Industries Inc., Howell, Mich.
Filed Feb. 21, 1974, Ser. No. 444,397
Int. Cl.² H02B 1/20
U.S. Cl. 174—72 A **14 Claims**



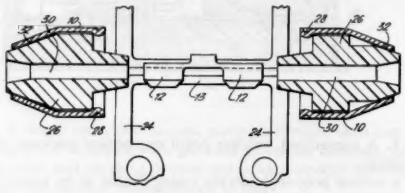
1. An electrical component mounting module for forming an integral wiring duct when two such modules are installed in a side-by-side relationship on a plane mounting surface, comprising a raised component rectangular mounting platform made of dielectric material a pair of longitudinally disposed, upwardly extending, substantially parallel and spaced apart sidewalls integrally formed with said platform along two opposite edges thereof, a pair of longitudinally disposed, substantially parallel and spaced apart leg members, the upper ends of such leg members being integral with and extending downward from said raised component mounting platform and an outwardly projecting flange integrally formed at the lower end of each of said leg members and extending substantially parallel to said platform, each of said flanges having an outermost longitudinal edge projecting further outward than

said sidewalls and apertures in said sidewalls for passage therethrough of electrical conductors.

3,909,506
COXIAL CABLE CONNECTOR AND METHOD THEREFOR

Luigi Campari, and Aldo Bruni, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 13, 1974, Ser. No. 532,572
Claims priority, application Italy, Dec. 31, 1973, 32498/73
Int. Cl.² H02G *15/08*
U.S. Cl. 174—88 C **6 Claims**

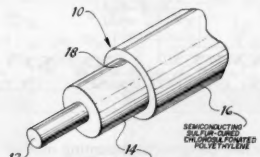


1. An element for use in an electrical connector for connecting the opposed ends of two coaxial cables, said element comprising a pair of ferrules arranged in axial alignment and being connected to each other, said ferrules being for crimped connection to the inner conductors of the coaxial cables, a pair of tubular contacts disposed one at each of two opposed ends of a connecting member, the tubular contacts being positioned in axial alignment with each other and with the pair of ferrules, the ferrules being disposed between the tubular contacts and supported by a branch member integral with the connecting member, the branch member being severable when the ferrules are crimp connected to the inner conductors of the coaxial cables, and a spacer of electrically insulating material disposed in each said tubular contact and having an axially extending through hole in alignment with the ferrules.

3,909,507
ELECTRICAL CONDUCTORS WITH STRIPPABLE POLYMERIC MATERIALS

Joseph E. Betts, Westport, and Joseph E. Vostovich, Bridgeport, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,326
Int. Cl. H01b *7/34*
U.S. Cl. 174—102 SC **10 Claims**

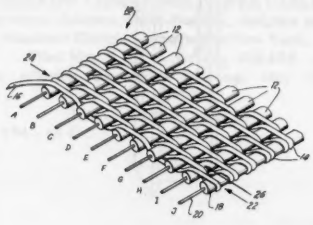


1. An insulated metallic electrical conductor having a covering thereon comprising, a combination of polymeric compositions including a composite of an electrically-insulating body of a peroxide-cured product of an ethylene-containing polymer with a surface adheringly joined to a contacting surface of an easily and cleanly strippable overlying semi-conductive body of a sulfur-cured product of an elastomer of chlorosulfonated polyethylene, with said contacting surfaces of the insulating body and overlying semiconductive body being adheringly joined to each other as a result of at least one of said polymeric materials having been cured while the said surfaces of each of the bodies are in adjoining physical contact with each other.

3,909,508
WOVEN ELECTRICALLY CONDUCTIVE CABLE AND METHOD

Edgar A. Ross, Greenville, S.C., assignor to Southern Weaving Company, Mauldin, S.C.

Continuation of Ser. No. 38,469, May 18, 1970, abandoned. This application Dec. 26, 1973, Ser. No. 427,561
Int. Cl.² H01B *7/00*
U.S. Cl. 174—117 M **9 Claims**

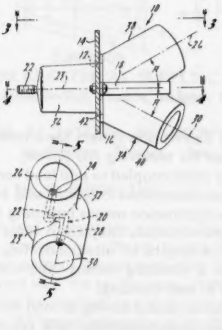


1. A woven electrically conductive cable comprising, in combination, a plurality of elongated, substantially parallel electrical conductors forming warp members of said cable, means for insulating said conductors with respect to one another, easily removable binding means for said conductors, said binding means comprising only a single continuous weft thread woven between and binding said conductors together in a pattern which is staggered in the weft direction, said weft thread passing over at least two adjacent conductors in each of a plurality of passes through said cable, one end of said weft thread being not bound with said conductors so that it is free to be pulled longitudinally of said conductors to free one end of said conductors from said binding means.

3,909,509
BUSHING WELL ASSEMBLY

John L. Fisher, Lexington, Ky., assignor to Kuhlman Corporation, Troy, Mich.

Filed Apr. 1, 1974, Ser. No. 456,611
Int. Cl.² H01B *17/26*; H01R *21/00*
U.S. Cl. 174—152 R **5 Claims**



1. For a transformer having an enclosure, a bushing well comprising

a. conductor means having

1. a first conductor disposed on a first axis for connection to said transformer,

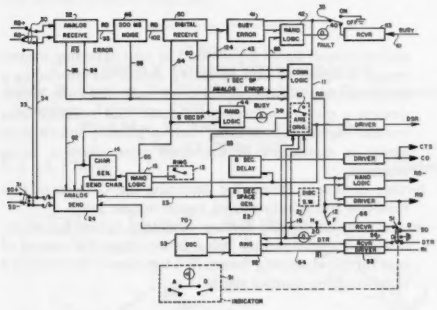
2. a second conductor disposed on a second axis for connection to a first terminator means and extending outwardly of said enclosure,
3. a third conductor disposed on a third axis for connection to a second terminator means and extending outwardly of said enclosure,
4. a fourth conductor attached to said first conductor and being disposed between and connected to said second and third conductors,
5. said three axes being disposed so that they are non-intersecting and so that no plane may be defined which contains any two of said axes,
6. at least one of said second and third axes being inclined at two angles with respect to said first axis with each of said two angles being defined in respective orthogonal projections, and

b. insulating means connected to said first, second, third and fourth conductors for supporting said conductor means relative to said enclosure and for insulating said conductor means therefrom.

3,909,510
DIRECT CONNECTION DIGITAL TRANSMISSION APPARATUS

David W. Luce, 834 Chautauqua Blvd., Pacific Palasades, Calif. 90272

Filed Oct. 5, 1973, Ser. No. 404,025
Int. Cl.² H04L *23/00*
U.S. Cl. 178—2 R **7 Claims**



1. Apparatus for interconnecting digital equipment to a direct current passing data transmission loop having at least a pair of line conductors cmprising:

a constant line current generator connected to each of said conductors for introducing substantially equal and opposite currents into the respective line conductors forming said loop;

means connecting a source of digital data to control the direction of current flow from said constant current generator to line conductors;

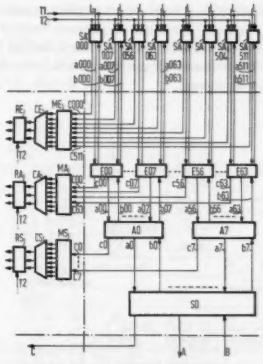
means for generating a code of alternate marks and spaces; means for generating a plurality of codes of predetermined lengths of spaces indicative of a plurality of control functions; and

means for introducing said codes into said connecting means to control the direction of flow of current from said constant current generator to said line conductors.

3,909,511
ARRANGEMENT FOR THE IDENTIFICATION OF REQUESTS IN PROGRAM-CONTROLLED DATA SWITCHING SYSTEMS

Anton Kammerl, Grobenzell, and Bernhard Schaffer, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 23, 1974, Ser. No. 508,620
Claims priority, application Germany, Sept. 25, 1973, 2348255
Int. Cl.² H04L *11/00;* **H04Q** *3/64*
U.S. Cl. 178—3 **10 Claims**



1. Arrangement for the prompt identification of lines connected to connection circuits of a programme-controlled data switching system and for coding the identification result, wherein each connection circuit is assigned a specific number, characterized in that the connection circuits include storage devices and gate switching elements, the items of information occurring on the lines being transferred into the storage devices in groups in response to a central interrogation pulse train, the gate switching elements being responsive to the occurence of one of said items to emit a request criterion, a series of decentralized identification devices arranged in stages in accordance with coordinate principles, each stage including means for identifying one digit of the code characterizing the connection circuit emitting the requests and connected request and resetting lines connecting said identification devices in successive stages, and coding switching elements for coding the identification result of each stage and registers coupled to said coders for storing the results of said coding, said registers holding the resultant identification of said request.

3,909,512
SOUND INFORMATION REPRODUCING APPARATUS FOR USE IN A STILL PICTURE BROADCASTING SYSTEM

Yoshitaka Omori, and Morihiro Kubo, both of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Oct. 5, 1973, Ser. No. 403,967
Claims priority, application Japan, Oct. 6, 1972, 47-101030
Int. Cl.² H04N *7/04, 5/78*
U.S. Cl. 178—5.6 **15 Claims**

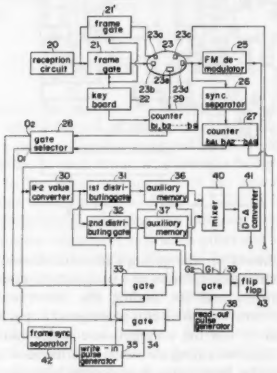
2. A sound information reproducing apparatus for use in a still picture broadcasting system which repeatedly broadcasts video information signals for n frames of still pictures and corresponding sound information signals respectively relating to and providing a description of the still pictures wherein the time base of the sound information is compressed, and in which a frame of still picture information is composed of *l* fields, each field composed of a predetermined number of lines and the sound information related to each such picture

frame is composed of m sections, each said sound information section being of a duration substantially equal to an integer multiple of the period of one line of a picture field, the integer being greater than one, wherein *l*, *m* and *n* are integers, said reproducing apparatus comprising:

gate means for selecting a desired frame of still picture information and the corresponding sound information out of the said n frames of still pictures and corresponding sound information broadcasted,

main memory means for receiving and storing the frame of still picture information and the related sound information selected by said gate means in respectively associated, separate storing locations,

means for scanning said main memory for repeatedly reading out in each of successive, predetermined scanning periods, the video information of the selected frame and the related *m* sections of sound information for the selected frame as stored,



auxiliary memory means for receiving and storing one section of the selected sound information as read out from the main memory, at a first rate and during the time period in which said section of the sound information is scanned in the main memory means, said auxiliary memory means receiving and storing each of the successive sections of sound information in the corresponding time periods of respective, successive ones of said predetermined scanning periods of said main memory, and

means for reading out the section of sound information stored in the auxiliary memory means at a second, slower rate and during that portion of the predetermined scanning period of the main memory in which the remaining sections of the sound information stored in the main memory are scanned, for each such stored section of sound information in succession, thereby expanding the time base of the sound information for reproduction of the original sound information.

3,909,513

FACSIMILE SYSTEM

Yutaka Tanaka, and Sumio Ogawara, both of Tokyo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Matsushita Graphic Communication Systems, Inc., Tokyo, both of, Japan

Filed Oct. 17, 1972, Ser. No. 298,248

Claims priority, application Japan, Oct. 18, 1971, 46-82590; Nov. 24, 1971, 46-94793

Int. Cl. H04n *1/02*

U.S. Cl. 178—6 **8 Claims**

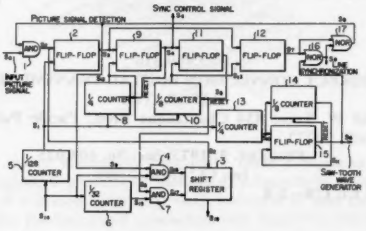
1. A facsimile system which comprises

scanning means to scan an original bearing picture information at one constant speed;

detecting means to detect the presence of a picture information signal from said scanning means during each scan for each one of a plurality of divisions of a scan zone;

memory means coupled to said scanning means for storing, at a high speed, the picture information signal obtained from said scanning means during each scan for one said division;

means coupled to said detecting means and to said memory means to read out, at a low speed lower than said high speed, the picture information signal stored in said memory means when a picture information signal is detected



and an output signal is provided by said detecting means;

means coupled to said detecting means for producing a synchronizing control signal when said detecting means detects a picture information signal, said synchronizing control signal representing that a picture information signal is contained in the scan zone division being scanned;

further detecting means for detecting the outputs of said read-out and synchronizing signal means; and

means coupled to said further detecting means for reproducing original picture information from the output of said further detecting means as a function of the detected synchronizing control signal.

3,909,514

FACSIMILE COMMUNICATION SYSTEM

Yutaka Tanaka, Kadoma; Takamasa Shintani, Tokyo; Sumio Ogawara, Tokyo, and Yoshikazu Sekine, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Matsushita Graphic Communication System, Inc., Japan

Filed June 21, 1974, Ser. No. 481,790

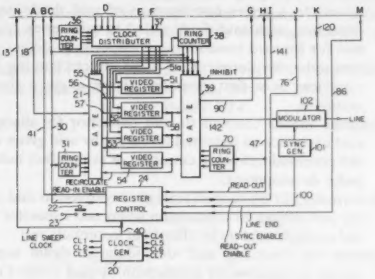
Claims priority, application Japan, June 25, 1973, 48-71882

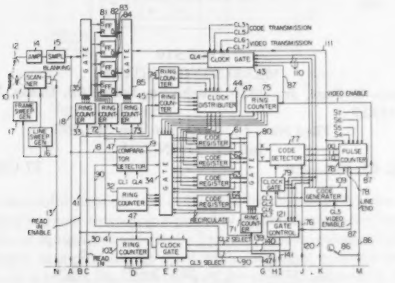
Int. Cl.[2] H04N *7/12*

U.S. Cl. 178—6 **26 Claims**

1. A method of transmitting signals representative of the light values of a two-valued object field, comprising the steps of: sequentially scanning line paths within the two-valued object field to generate a one-line signal; storing the one-line signal; segmenting the one-line signal; repeatedly comparing each of the segments of the one-line signal of a given line path with each of the segments of the one-line signal of an adjacent line path to generate a sequence of first and second codes, the first code being generated upon occurrence of coincidence therebetween and the second code upon occurrence of non-

coincidence therebetween; transmitting said first and second codes in sequence; detecting the occurrence of said second





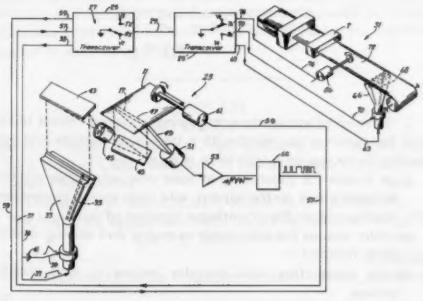
code, and transmitting a segment of the one-line signal when said second code is detected.

3,909,515

FACSIMILE SYSTEM WITH MEMORY

Arthur W. Evansen, Lomita, Calif., assignor to The Magnavox Company, Torrance, Calif.

Filed Mar. 27, 1973, Ser. No. 345,309
Int. Cl. H04n *1/02*
U.S. Cl. 178—6 **27 Claims**



1. A method for substantially reproducing a picture including generally dark areas separated by generally light areas, and each of the areas defined by a beginning address and an ending address, including the steps of:

scanning the picture at a substantially constant rate of speed to provide digital data corresponding to at least a portion of the generally light areas and generally dark areas of the picture;

storing the provided data in a first memory;

ascertaining the beginning address and the ending address of at least a particular group of the data stored in the first memory and corresponding to one of the generally light areas and generally dark areas of the picture;

transmitting address information corresponding to the beginning address and the ending address of the particular group of data determined in the ascertaining step; and

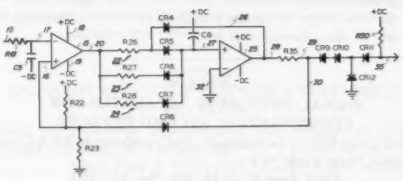
transmitting from the first memory the digital data defined by the address information transmitted.

3,909,516

CARRIER DETECT CIRCUIT FOR RECEIVER RECORDER START UP

Bruce R. Kanitz, Fairport, N.Y., and Charles L. Jacobson, Plano, Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1973, Ser. No. 418,530
Int. Cl.[2] H04N *5/76;* **H04B** *1/16;* **H04Q** *1/24*
U.S. Cl. 178—6.6 R **5 Claims**



1. A carrier signal detector circuit for generating an output signal in response to an initial input signal derived from a carrier signal including repetitive periods for a first level component above a threshold level within a predetermined range and a second level component of shorter duration outside said range, said detector circuit comprising:

first switching means coupled to receive an input signal for generating a first signal when the input signal is above said threshold level and generating a second signal when the input signal is below said threshold level,

a capacitor,

second switching means responsive to a preselected voltage on said capacitor for generating said output signal, and

charge control means responsive to said first signal to charge said capacitor at a first rate and responsive to said second signal to discharge said capacitor at a second rate, said charging and discharging of said capacitor changing the voltage on the capacitor to said preselected voltage within multiple periods of said initial input signal whereby said output signal is generated by said second switching means.

3,909,517

DISC RECORDS WITH GROOVE BOTTOM DEPTH VARIATIONS

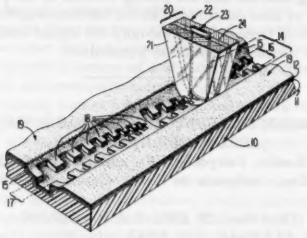
Jon Kaufmann Clemens, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 126,772, March 22, 1971, Pat. No. 3,842,194. This application Dec. 3, 1973, Ser. No. 420,782The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.
Int. Cl.[2] G11B *11/00, 3/72;* **H04N** *5/76*
U.S. Cl. 178—6.6 A **2 Claims**

2. A disc record having a spiral groove in a surface thereof; said spiral groove having respective curved sidewalls of substantially invariant geometry throughout successive convolutions of the spiral;

the groove cross-section alternating along said groove between a first recurring shape in which the curved surfaces of the respective groove sidewalls and the intervening groove bottom define a continuous smooth curve and a second recurring shape in which the surface of said intervening groove bottom is depressed relative to the groove

bottom level associated with the definition of said continuous smooth curve for said first shape;

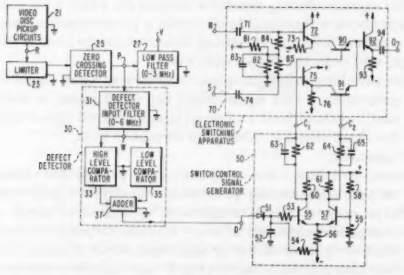


the frequency of occurrence of the alternations of the groove cross-section between said first shape and said second shape along the length of said spiral groove varying in accordance with recorded information.

3,909,518
SIGNAL SWITCHING APPARATUS FOR COMPENSATING RECORD DEFECTS

Alfred Lynn Baker, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed June 6, 1974, Ser. No. 477,103
Int. Cl.[2] H04N 5/76
U.S. Cl. 178—6.6 R **6 Claims**



1. In a system for playback of a record of successive images, said system including pickup means for recovering from said record carrier waves having an instantaneous frequency which is subject to variation over a given deviation range in accordance with the amplitude of an image-representative video signal of a given bandwidth, there being random occasions during the recovery of said video signal when the apparent instantaneous frequency of said carrier waves departs from said given deviation range; frequency modulation detecting means coupled to said pickup means, said detecting means including a low pass filter having a passband substantially limited to said given video signal bandwidth for providing a demodulated signal having an amplitude normally corresponding to the amplitude of said video signal but subject to spurious amplitude variations during said occasions of carrier wave frequency departure from said given deviation range; image display means; and means for normally supplying the demodulated signal output of said low pass filter to said image display means; an image defect compensation system comprising, in combination:

means coupled to said frequency modulation detecting means for developing a defect indication pulse of a given polarity in response to a departure of said instantaneous frequency from said given deviation range, the pulse duration substantially corresponding to the departure duration;

a capacitor;

a diode;

means for applying the output of said pulse developing means to a series combination of said diode and said capacitor, with said diode poled in said series combination for forward conduction in response to defect indication pulse development, so as to effect charging of said capacitor to a first potential above a given threshold potential;

resistive means coupled to said capacitor for discharging said capacitor to potential levels below said given threshold potential following cessation of said defect indication pulse development;

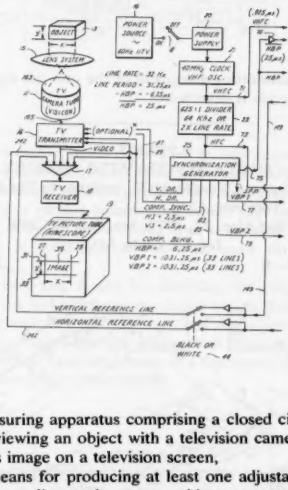
a normally cut off control transistor coupled to said capacitor and subject to conduction when said capacitor potential exceeds said given threshold potential; and

means for disabling said demodulated signal supplying means in response to conduction by said control transistor.

3,909,519
MEASURING SYSTEM

Lewis C. Page, Jr., 2630 Northaven, Suite 108, Dallas, Tex. 75229

Filed Nov. 10, 1972, Ser. No. 305,499
Int. Cl.[2] H04N 7/18
U.S. Cl. 178—6.8 **27 Claims**



1. Measuring apparatus comprising a closed circuit television for viewing an object with a television camera and producing its image on a television screen,

gage means for producing at least one adjustable position reference line on the screen, said gage means comprising:

counte means for counting a number of pulses,

encoder means for selectively entering and storing a reference number,

means connecting said encoder means to said counter means,

pulse stream generating means,

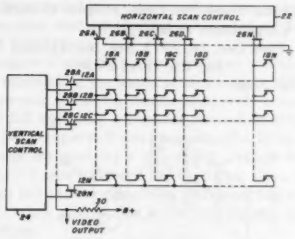
synchronizer means coupling the output to said generating means to said counter means at at least on predetermined time during each television screen frame,

modulator means to produce a first reference mark on the television screen at said predetermined time, and a second reference mark each time the number of pulses from said generating means fed to said counter means compares with the number selected with the encoder means, whereby the distance on said screen between said first and second reference marks is a direct function of the number selected with the encoder means.

3,909,520
READOUT SYSTEM FOR A SOLID-STATE TELEVISION CAMERA

William G. Mend, Catonsville, and Roland A. Anders, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 866,339, Oct. 14, 1969, abandoned. This application Feb. 29, 1972, Ser. No. 230,503
Int. Cl.² H04N *3/14*
U.S. Cl. 178—7.1 **5 Claims**



1. In a solid state electro-optical device, the combination of a mosaic sensor including a plurality of phototransistors onto which an optical image is to be focused, said transistors being arranged in a plurality of rows and orthogonal columns thus forming a matrix, the collectors of the phototransistors in the respective rows being connected to a first set of common conductors, the emitters of the phototransistors in the respective columns being connected to a second set of common conductors, a first set of collector switches equal in number to the number of rows connected between said first set of conductors and a first terminal, a second set of emitter switches equal in number to the number of columns connected between said second set of conductors and a second terminal, a load resistor connected between said first terminal and a third terminal, a source of direct current driving potential directly connected to said second and third terminals, means for sequentially closing said first set of switches, and means for sequentially closing said second set of switches at a rate higher than the closing rate of said first set to provide readout of said phototransistors in succession while commutating the emitters thereof to said second terminal.

3,909,521
INFRARED IMAGING SYSTEM

Robert P. Hunt, Menlo Park, and Richard H. Winkler, Palo Alto, both of Calif., assignors to Spectrotherm Corporation, Santa Clara, Calif.

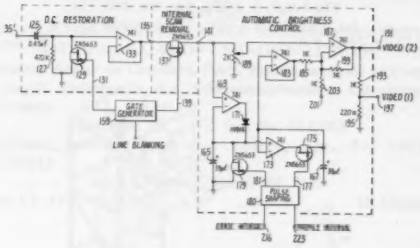
Division of Ser. No. 232,015, March 6, 1972, Pat. No. 3,798,366. This application Feb. 11, 1974, Ser. No. 441,279
Int. Cl.² H04N *5/38*
U.S. Cl. 178—7.2 **6 Claims**

1. An automatic video brightness control circuit, comprising:

means for repetitively scanning an object field to produce sequential frames of time varying electrical signals proportional to a position varying electromagnetic energy intensity pattern of an object field,

means for detecting and storing the maximum level electrical signal during the time that the scanning means scans one frame of the object field electromegnetic radiation, whereby said maximum level of the electrical signal is proportional to the maximum brightness of the object field image,

means for transferring the stored maximum electrical signal level from said detecting and storing means to a second storage means after the end of each scanned frame, and means for combining the maximum signal level stored in

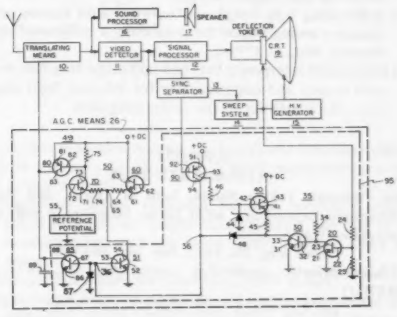


said storage means with said time varying electrical signal generated by the scanning means.

3,909,522
COINCIDENCE GATED AGC FOR A TELEVISION RECEIVER

Judson A. Hofmann, Schaumburg, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 4, 1973, Ser. No. 366,944
Int. Cl.² H04N *5/52*
U.S. Cl. 178—7.3 R **8 Claims**



1. A television receiver including signal translation means for receiving and translating television signals modulated with picture information and synchronizing pulse information, comprising:

a video detector, coupled to said signal translation means, recovering said modulated information;

a sync separator, coupled to said video detector, separating said synchronizing pulse information from said picture information;

a sweep system, coupled to said sync separator, generating sweep signals including retrace pulses;

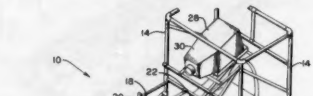
AGC means, coupled to said video detector and to said sync separator and to said sweep system, generating a control voltage, representative of the video detector output level, and applying said control voltage to said signal translation means to control the gain thereof and maintain the video detector output at a predetermined level, the control voltage generating capability of said AGC means being variable; and

means operating said AGC means at a greater control voltage generating capability during coincidence between said synchronizing pulses and said retrace pulses and at a lesser, but more than zero capability, during non-coincidence in response to said synchronizing pulses.

3,909,523
CRT PROJECTION LENS

John F. Bartucci, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Apr. 8, 1974, Ser. No. 458,734
Int. Cl.[2] G02B *17/00, 27/10;* **G03B** *21/56*
U.S. Cl. 178—7.8 **9 Claims**



1. A simulator system for projecting a color image to the eye of a viewer which provides for an enlarged aperture at the eye of the viewer while maintaining color integrity of the image, comprising:

image projecting means for projecting an optical image;

a screen positioned opposite said projecting means for receiving said optical image;

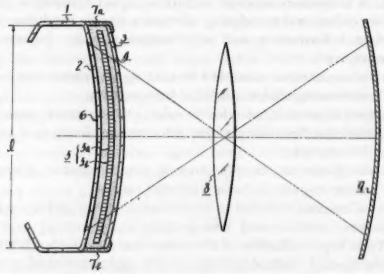
a collimating lens positioned between said screen and a trainee viewing station for presenting a collimated image thereto; and

a lens system interposed between said projecting system and said screen and compensating for inherent light dispersion characteristics of the collimating lens.

3,909,524
CATHODE RAY TUBE

Akio Ohkoshi; Takizo Shiota, both of Tokyo, and Nobuo Kitamura, Sagamihara, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 20, 1973, Ser. No. 389,999
Claims priority, application Japan, Aug. 24, 1972, 47-98837[U]
Int. Cl.[2] G02B *5/22;* **H01J** *29/06, 29/22*
U.S. Cl. 178—7.85 **8 Claims**



1. A cathode ray tube having a face panel and a transparent safety plate mounted on said tube in spaced relation to said face panel, an optical filter mounted between said face panel and said safety plate in a transparent resin which fills the space between said face panel and said safety plate and holds said filter in place, said optical filter comprising a composite sheet made of a plurality of parallelepipeds of transparent material having a first viewing side facing toward said safety plate, a second side parallel to said first side and facing said face panel, and third and fourth sides parallel to each other and respectively joining said first and second sides, a light impervious layer on at least one of said third and fourth sides and said plurality of parallelepipeds joined on their third and fourth sides together to form a sheet filter structure such that the light impervious layer is between adjacent parallelepipeds.

3,909,525
DISPLAY SYSTEM OPTICS

James R. Fagan, Columbus, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1973, Ser. No. 423,629
Int. Cl.[2] H01J *29/89*
U.S. Cl. 178—7.85 **4 Claims**

1. In a magnified image display system, in combination:

an array of magnifying Fresnel lenses, each Fresnel lens in said array of Fresnel lenses laterally abutting an adjacent Fresnel lens and having an optical center,

an array of image generators, each image generator in said array of image generators having an optical center aligned with a different one of said Fresnel lens optical centers along an associated viewing axis and having an image display area spaced-apart from the display area of an adjacent image generator in said array of image generators, and

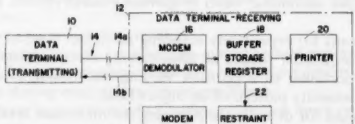
an array of spaced-apart image modules displayed at said image generator image display areas, each image module in said array of image modules having a unique image area and an overlap image area joining said unique image area,

each said image module overlap image area duplicating image details of the unique image area displayed most adjacent thereto at another of said image modules.

3,909,526
SQUARE WAVE OSCILLATOR FOR A DATA TERMINAL

Richard D. Fretwell; James W. Azbell, both of Columbus, and Edwin E. Mason, Harrisburg, all of Ohio, assignors to MI[2] , Columbus, Ohio

Division of Ser. No. 245,769, April 20, 1972, Pat. No. 3,781,817. This application July 16, 1973, Ser. No. 379,795
Int. Cl.[2] H04L *27/14*
U.S. Cl. 178—66 R **8 Claims**



1. A data terminal, comprising a data modulator and a buffer having a full signalling means, further comprising a

restraint signal generator including a wave oscillator comprising:

a. a high gain differential comparator circuit having an inverting input, a non-inverting input and an output;

b. a first voltage divider feedback network connected to said output, to a common ground, and to one of said inputs for applying a proportion of the signal at said output to said one input; and

c. a second feedback network including a series connected pair of resistances connected between said output and the other of said inputs, and a capacitance connected between the common node of said resistance pair and an AC ground;

said data modulator connected to the output of said generator, and said buffer connected to the input of said generator;

said output of said oscillator connected to said modulator for modulating the signal at said output; and including electronic switching means effectively connected I to said full signalling means for control thereby II to one of said comparator circuit inputs and III to a fixed dc voltage for applying a selected dc voltage level to one of said inputs to inhibit the oscillator when said buffer is not full and for effectively disconnecting said voltage level when said buffer is full freeing the oscillator to oscillate.

3,909,527

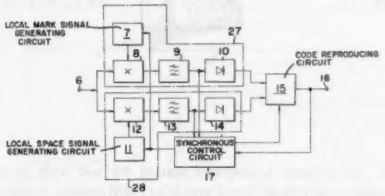
FREQUENCY SHIFT KEYING SYSTEM AND METHOD

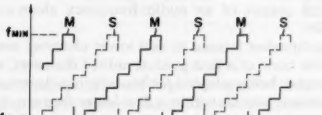
Takahisa Ohta, and Shigeo Sugimura, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 18, 1973, Ser. No. 398,463

Int. Cl. H04b *1/00, 7/00*

U.S. Cl. 178—66 R **9 Claims**


LOCAL MARK SIGNAL GENERATING CIRCUIT
LOCAL SPACE SIGNAL GENERATING CIRCUIT
CODE REPRODUCING CIRCUIT
SYNCHRONOUS CONTROL CIRCUIT



1. A frequency shift keying method, which comprises the steps of: transmitting N types of signals having different shift patterns which correspond to N values of code elements ($N \geq 2$) in substantially the whole allocated band during one clock period;

comparing N types of heterodyne detector outputs provided by N types of local signals for receiving, having each frequency shift pattern synchronized to N types of the transmitting signals, an said local signals each having a constant frequency difference from the transmitting signals; and

detecting the heterodyne detector circuit having the maximum output whereby the transmitted code element is detected and reproduced.

3,909,528

DEVICE FOR FINDING A FIXED SYNCHRONIZATION BIT IN A FRAME OF UNKNOWN LENGTH

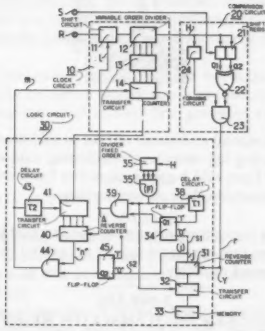
Francois Augier de Cremiers, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Apr. 26, 1974, Ser. No. 464,983

Claims priority, application France, Apr. 27, 1973, 73.15442

Int. Cl.² H04L *7/00*; **G06F** *7/02*

U.S. Cl. 178—69.5 R **10 Claims**



1. A device for determining the length of a repetitive digital train of unknown length having a fixed synchronization bit, said device comprising

comparison means receiving incident repetitive digital trains of unknown length for comparing two bits in an incident train, said bits being separated by n clock instants,

clock circuit means for generating clock pulses,

logic circuit means coupled to said comparison means and said clock circuit means for sampling the coincidence of said two bits on a predetermined number of said trains, said logic circuit means including first means for effecting successive shifts of the timing of said clock circuit means upon the failure to detect coincidence on said predetermined number of trains until coincidence is effected, and second means for restarting the sampling by said logic circuit means for two bits separated by $n + 1$ clock instants upon failure to detect coincidence after n shifts effected by said first means.

3,909,529

IMMERSIBLE DIVER'S MICROPHONE

Charles T. Morrow, Arlington, and Austin J. Brouns, Dallas, both of Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1971, Ser. No. 212,002

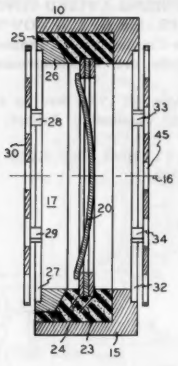
Int. Cl.² H04R *15/00, 7/12*

U.S. Cl. 179—1 UW **6 Claims**

1. An improved Immersible Microphone designed for coupling to external circuitry for reproduction of sound comprising:

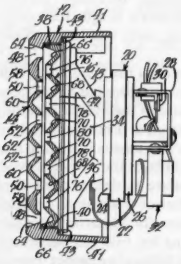
a. a housing member having a hollow central portion, said hollow portion having first and second ends;

b. a ceramic bimorph ring disposed in said hollow portion;
c. an epoxy compound affixing said ring within said housing;
d. a diaphragm shaped as a small segment of a sphere affixed to said ring;



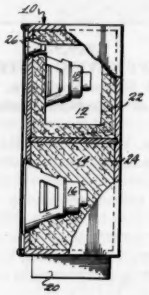
e. first and second end plates affixed to said housing individually having leg members positioning said end plates a distance from said housing members for providing drainage from said hollow central portion;
and
f. electrical connecting means attached to said bimorph ring for connecting electrical signals generated by said ring to said external circuitry.

3,909,530
LOUDSPEAKER WITH SHALLOW RE-ENTRANT GRILLE-LIKE HORN
Earl W. Gosswiller, Clarendon Hills, Ill., assignor to Federal Sign and Signal Corporation, Chicago, Ill.
Filed Jan. 7, 1974, Ser. No. 431,136
Int. Cl.[2] H04R 1/02
U.S. Cl. 179—1 E **6 Claims**



1. A loudspeaker comprising, in combination, a diaphragm, and a shallow re-entrant horn disposed adjacent the front of said diaphragm, said re-entrant horn comprising a protective grille-like baffle member arranged substantially parallel to the front of said diaphragm in proximity thereto, said grille-like baffle member having a first plurality of concentric annular baffle elements and first intermediate annular openings located approximately in a first plane adjacent to said diaphragm, and a second plurality of complementary concentric annular baffle elements and second intermediate annular openings located approximately in a second plane disposed parallel to and outwardly of said first plane, said first plurality of baffle elements comprising outwardly directed annular concave deflectors and said second plurality of baffle elements comprising inwardly directed annular concave deflectors, said first annular openings being aligned with the deflectors in said second plane, the deflectors in said first plane being aligned with the openings in said second plane, and the annular openings in said second plane being at greater average radii compared to the annular openings in said first plane, whereby sound waves projected forwardly from said diaphragm through the annular openings in said first plane are deflected rearwardly by the deflectors in said second plane and then are deflected forwardly through the annular openings in said second plane by the deflectors in said first plane so as to traverse a re-entry type sound path which affords a sound expansion profile.

3,909,531
ACOUSTIC TRANSDUCER SYSTEM
Jan P. Plummer, Atlanta, Ga., assignor to Custom Electronics Incorporated, Atlanta, Ga.
Filed Mar. 25, 1974, Ser. No. 454,759
Int. Cl. H04R 1/28
U.S. Cl. 179—1 E **8 Claims**



1. An acoustic transducer system for use with an audio frequency electrical signal amplifier, said system comprising:
a cabinet structure having separate closed upper and lower speaker housing chambers of substantially equal volume,
electrical input connections adapted for connection to the electrical output of an audio frequency electrical signal amplifier,
a bass loudspeaker housed in said lower chamber and having a speaker cone of a first predetermined diameter, said bass loudspeaker being adapted for transducing electrical signals into acoustic signals within a first lower frequency range,
a midrange loudspeaker housed in said upper chamber and having a speaker cone of a second predetermined diameter equal to said first predetermined diameter, said midrange loudspeaker being adapted for transducing electrical signals into acoustic signals within a second middle frequency range which, at its lower frequency portion, overlaps the upper frequency portion of the first lower frequency range, each of said chambers being defined by solid, nonapertured walls on all but a front side, which front side is also solid except for an aperture therein directly behind which the respectively associated loudspeaker is mounted,
electrical circuit means for electrically connecting said electrical input connections to said bass and midrange loudspeakers including an electrical crossover network which effectively prevents electrical signals below a predetermined crossover frequency from being applied to said midrange loudspeaker.

3,909,532

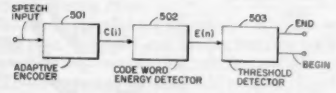
APPARATUS AND METHOD FOR DETERMINING THE BEGINNING AND THE END OF A SPEECH UTTERANCE

Lawrence Richard Rabiner, Berkeley Heights, N.J.; Lewis Hyman Rosenthal, Cambridge, Mass., and Ronald William Schafer, New Providence, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 29, 1974, Ser. No. 456,027

Int. Cl.[2] G10L 1/04

U.S. Cl. 179—1 SC 27 Claims



1. Apparatus for determining a boundary of an applied speech utterance comprising:

means for adaptive encoding said applied speech utterance to develop coded output signals;

means for developing a signal representative of the energy of said coded output signals; and

means for comparing said representative signal with a predetermined threshold signal.

3,909,533

METHOD AND APPARATUS FOR THE ANALYSIS AND SYNTHESIS OF SPEECH SIGNALS

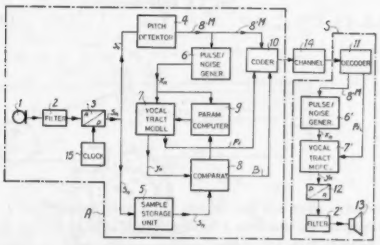
Louis Sepp Willimann, Eschenbach, Switzerland, assignor to Gretag Aktiengesellschaft, Switzerland

Filed Oct. 8, 1974, Ser. No. 513,160

Claims priority, application Switzerland, July 22, 1974, 10066/74

Int. Cl.[2] G10L 1/00

U.S. Cl. 179—1 SA 11 Claims



1. In a method of analysing and synthesizing speech in which speech synthesis is effected by use of a synthesis vocal tract model which functionally corresponds to the human vocal tract and which is constructed essentially from a discrete linear filter, comprising:

A. an analysis operation including the steps of

1. sampling an original speech signal and deriving therefrom

1a. a first group of signals representing parameters of said synthesis vocal tract model;

1b. a second group of signals representing the fundamental frequency reciprocal (hereinafter referred to as the "pitch period"); and

1c. a third group of signals representing the voiced/-voiceless character of each sample of the original speech signal; and

B. A synthesis operation including the steps of

1. adjusting said synthesis vocal tract model by reference to said first group of signals, and

2a. during voiced samples of the original speech signal, exciting said synthesis vocal tract model by a train of pitch period spaced pulses,

2b. during voiceless samples of the original speech signal, exciting said synthesis vocal tract model by white noise,

whereby a synthetic speech signal similar to said original speech signal is produced,

The improvement wherein:

C. said analysis operation (A) is performed by use of an analysis vocal tract model identical to said synthesis vocal tract model;

D1. during voiced samples of the original speech signal said analysis vocal tract model is excited by a train of pitch period spaced pulses;

D2. during voiceless samples of the original speech signal said analysis vocal tract model is excited by white noise;

E. an output signal from the analysis vocal tract model is sampled and compared with the original speech signal;

F. The parameters of the analysis vocal tract model are modified as a result of step (E) to minimize the deviation between the output signal and the original speech signal; and

G. those parameters of said analysis vocal tract model for which the deviation falls below a predetermined threshold value are used as said first group of signals in step (A1*a*).

3,909,534

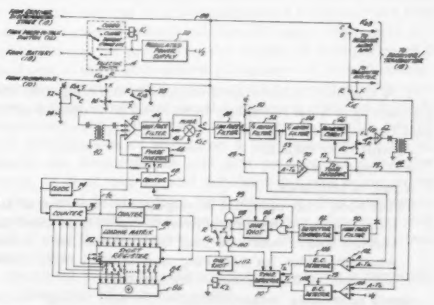
VOICE PRIVACY UNIT FOR INTERCOMMUNICATION SYSTEMS

Henrie L. Majeau, Bellevue; Roland O. Barnes, Federal Way; Robert G. Hove, Mercer Island, and Abraham L. Angell, Jr., Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 178,000, Sept. 7, 1973, abandoned. This application Nov. 12, 1973, Ser. No. 415,103

Int. Cl.[2] H04K 1/02

U.S. Cl. 179—1.5 R 15 Claims



1. An apparatus for coding audio signals which are present in a unit of an intercommunication system to prevent unauthorized voice recognition thereof, comprising:

a. means for providing a coding signal when the audio signals are to be coded;

b. a first frequency generator means for producing, in response to said coding signal, a first signal having a frequency f_1 and a second signal having a frequency f_2;

c. a control means which is coupled to said first frequency generator means for causing a shift in the relative phasing of said first and said second signals to occur at a predetermined time after production of said coding signal;

d. detecting means having said first and said second signals coupled thereto and including a phase detecting means responsive to said shift in the relative phasing of said first and said second signals for providing a synchronizing signal;

e. a second frequency generator means capable of providing an output signal whose frequency f_c varies in a pseudo-random sequence;

f. means starting said second frequency generator means at a predetermined point in said pseudo-random sequence in response to said synchronizing signal; and,

g. means mixing said output signal with the audio signals.

3,909,535

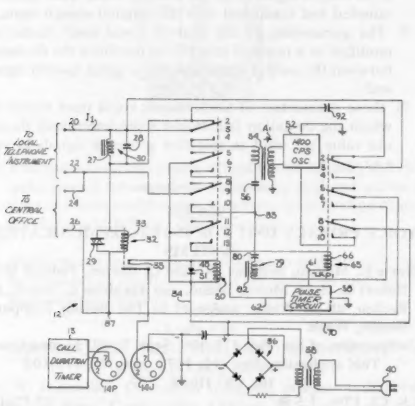
TELEPHONE COUPLER UNIT

Walter Zuckerman, 15622 Royal Ridge Rd., Sherman Oaks, Calif. 91403

Filed Aug. 23, 1971, Ser. No. 174,006

Int. Cl.[2] H04M *11/02*

U.S. Cl. 179—2 C **3 Claims**



2. A telephone coupler unit coupled to the telephone lines connecting a local telephone instrument to a central office, said coupler unit comprising:

control relay means;

a voltage source;

a pair of terminals;

an off hook relay operative in response to the lifting of said local telephone instrument from its cradle to connect said voltage source and said pair of terminals in a circuit which provides for actuating said control relay means when said pair of terminals are shorted;

signal generating means energized by said voltage source and coupled to the telephone lines in response to the actuation of said control relay means for periodically generating and impressing audio signals on said telephone lines, and

filter means including a parallel capacitor-inductor filter and a series capacitor-inductor filter;

said filter means being coupled to the telephone lines in response to the actuation of said control relay means and during the generation of said audio signals by inserting said parallel capacitor-inductor filter in one of the telephone lines leading to the central office and by connecting said series capacitor-inductor filter across the telephone lines leading to the central office;

whereby the audio signals impressed on the telephone lines by said signal generating means are transmitted on the telephone lines leading to said local telephone instrument but are prevented by said filter means from being transmitted on the lines leading to said central office.

3,909,536

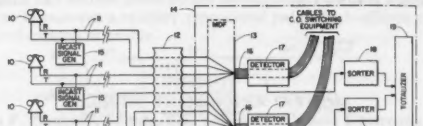
AUDIENCE SURVEY SYSTEM

Douglas John Watson, and Peter Parkinson, both of Ottawa, Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed May 6, 1974, Ser. No. 467,267

Int. Cl.[2] H04M *11/06*

U.S. Cl. 179—2 AS **11 Claims**



1. An incasting communication system comprising:

a plurality of distributed sources;

a central sink;

a plurality of communication paths for connecting said sources to said sink;

means located at each of said sources for generating and transmitting on a respective one of the paths a signal having predetermined characteristics; and

means located at the sink for detecting the presence of said signal on any one of a plurality of said communication paths, said detector means being concurrently connected to said plurality of communication paths.

3,909,537

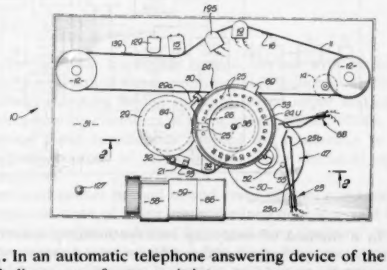
TELEPHONE ANSWERING APPARATUS

Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406

Filed Aug. 21, 1973, Ser. No. 390,315

Int. Cl. H04m *1/64*

U.S. Cl. 179—6 R **18 Claims**



1. In an automatic telephone answering device of the type including means for transmitting an announcement to a telephone line during an announcement transmit portion of an answering cycle and having a reel-to-reel tape mechanism on which incoming messages are recorded during a subsequent incoming message record portion of the answering cycle, the improvement comprising:

a rim driven, incoming message tape take-up reel,

a number ring having numerals on its upper surface, there being a certain angular separation between said numerals, said number ring being directly gear driven from said take-up reel so as to advance by a fixed angular extent corresponding to said separation during each incoming message record portion of the answering cycle, so that the numeral aligned at some fixed reference point is indicative of the number of calls which have been answered since the incoming message tape last was rewound, said number ring having gear teeth at its periphery,

a relatively small diameter first gear mounted for rotation in unison with said take-up reel,

a second gear of relatively large diameter driven by said take-up reel-associated first gear, said second gear making one revolution for a certain fixed number of revolutions of said take-up reel,

a termination-switch actuating member affixed to said second gear,

a switch actuated by said actuating member once each revolution of said second gear,

a circuit responsive to actuation of said switch for terminating the answering cycle,

a smaller third gear mounted for rotation in unison with said second gear, said third gear driving the gear teeth at the periphery of said number ring, said first, second and third gears cooperating to advance said number ring continuously as tape is wound onto said take-up reel when incoming messages are recorded and to counter-rotate said number ring as tape is rewound from said take-up reel back to a supply reel,

said device having a housing with a window situated so that only a limited number of said numerals on said number ring are visable through said window.

3,909,538

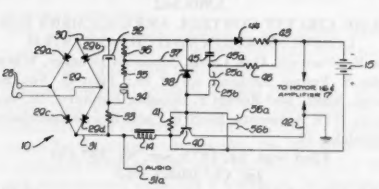
CONTROL CIRCUIT FOR TELEPHONE ANSWERING DEVICE WITH END OF TAPE DETECTION MEANS

Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406

Division of Ser. No. 254,924, May 19, 1972, Pat. No. 3,818,141. This application Apr. 19, 1974, Ser. No. 462,357

Int. Cl.[2] H04M *1/64, 11/10*

U.S. Cl. 179—6 R **4 Claims**



2. In a telephone answering device of the type wherein incoming messages are recorded on a reel-to-reel magnetic tape, said device including a drive motor for said magnetic tape and other electrical components for performing telephone answering operations, means, operatively connected to said drive motor and to said other components, for inhibiting subsequent answering operation of said device when insufficient tape remains on the supply reel to record additional incoming messages, comprising;

a single control element on said magnetic tape near the terminal end thereof,

detector means on said device for detecting the presence of said control element when substantially all of said tape has been filled with incoming messages,

a ring-responsive circuit for connecting power to the drive motor and other components of said device and for loading the telephone line so as to enable automatic answering of incoming telephone calls in response to a ringing signal, and

disconnection means cooperating with said circuit for disconnecting power from said motor and other components upon detection by said detector means of said control element and for keeping said telephone line loaded, so that subsequent callers will receive a busy signal.

3,909,539

FOUR-CHANNEL STEREOPHONIC DEMODULATING SYSTEM

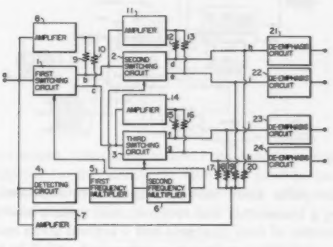
Tuneo Ohkubo, Katano, and Yoshio Horiike, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sept. 19, 1973, Ser. No. 398,849

Claims priority, application Japan, Sept. 29, 1972, 47-98518

Int. Cl.[2] H04H *5/00*

U.S. Cl. 179—15 BT **5 Claims**



1. A four-channel stereophonic demodulating system for demodulating a four-channel stereophonic composite signal containing a main channel signal component constituted by a first one of four different combinations of signals, said combinations of signals being obtained from four signals stereophonically related to one another, a first subchannel signal component obtained through suppressed-carrier amplitude modulation of a second one of said combinations of signals on a first subcarrier wave, a second subchannel signal component obtained through suppressed-carrier amplitude modulation of a third one of said combinations of signals on a second subcarrier wave 90° out of phase with respect to said first subcarrier wave, a third subchannel signal component obtained through suppressed-carrier amplitude modulation of a fourth one of said combinations of signals on a third subcarrier wave at double the frequency of said first and second subcarrier waves, at least one of said subchannel signal components having a level different from the levels of the other subchannel signal components, and a pilot signal having a frequency one half of said first subcarrier wave, said demodulating system comprising:

means for producing a first switching signal at a harmonic frequency of said pilot signal;

means for producing a second switching signal at another harmonic frequency of said pilot signal;

a first switching circuit supplied with said four-channel stereophonic composite signal and operated by said first switching signal for producing a pair of output signals from the supplied composite signal;

second and third switching circuits operated by said second switching signal for producing four audio signals at their output terminals from the supplied output signals of said first switching circuit;

means for supplying the outputs of said first switching circuit to said second and third switching circuits;

means for deriving said four audio signals from the outputs of said second and third switching circuits; and

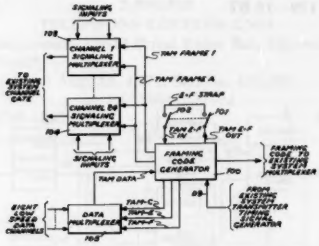
means adding the signal at the input of each of said switching circuits to the output thereof to obtain level adjustments between the first, second and third subchannel signal components.

3,909,540

DATA AND SIGNALING MULTIPLEXING IN PCM SYSTEMS VIA THE FRAMING CODE

Thomas Paul Maryscuk, and Lehman Holson Johnson, III, both of Raleigh, N.C., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 3, 1974, Ser. No. 503,014
Int. Cl.[2] H04J *3/12, 3/06*
U.S. Cl. 179—15 BY **25 Claims**



1. In a pulse code modulation time multiplexed system including a transmitter and receiver, said system having a first given number of data channels and a second given number of signaling channels per frame, a subsystem added to said system to provide at least N additional data channels, where N is an integer greater than one, comprising:

N sources of additional data;

a transmitter portion including

first means coupled to said N sources to time multiplex said additional data of said N sources into N time multiplexed channels; and

second means coupled to said first means, said second means producing at least one timing signal coupled to said first means to control the multiplexing of said additional data of said N sources, producing a framing code having a code bit position for each of 6N system frames, certain of said code bit positions having a distinctive pattern of code bits to provide frame synchronization, receiving said N time multiplexed channels from said first means and inserting each channel of said N time multiplexed channels into a different one of N others of said code bit positions to convey said additional data in said framing code without altering said distinctive pattern of code bits; and

a receiver portion including

third means coupled to said second means to receive said framing code, said third means recovering said N time multiplexed channels from said framing code, producing at least two timing signals and being responsive to said distinctive pattern of code bits to produce a synchronization control signal to synchronize said receiver of said system and said receiving portion; and

fourth means coupled to said third means responsive to said recovered N time multiplexed channels and said two timing signals to recover said additional data of said N sources.

3,909,541

LOW-SPEED FRAMING ARRANGEMENT FOR A HIGH-PEED DIGITAL BITSTREAM

Richard Thomas Bobilin, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

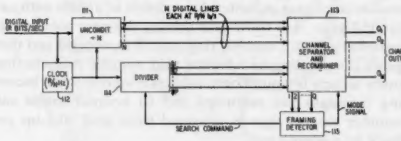
Filed Mar. 11, 1974, Ser. No. 450,202
Int. Cl.[2] H04J *3/06*
U.S. Cl. 179—15 BS **9 Claims**

1. In a time division multiplexed digital transmission system wherein the transmitted bitstream comprises a plurality of channels in a framed format, receiving apparatus for demultiplexing the bitstream comprising:

means for nonsynchronously distributing the bits of the received bitstream successively to form N low-speed digital bitstreams, each of the N digital bitstreams comprising bits corresponding to invariable positions in the received bitstream;

dividing means responsive to the received bitstream for producing P phased output signals;

switching means connected to receive the P phased output signals and the N low-speed bitstreams serving to redistribute the bits of the N bitstreams to supply a digital signal to each of M outputs; and



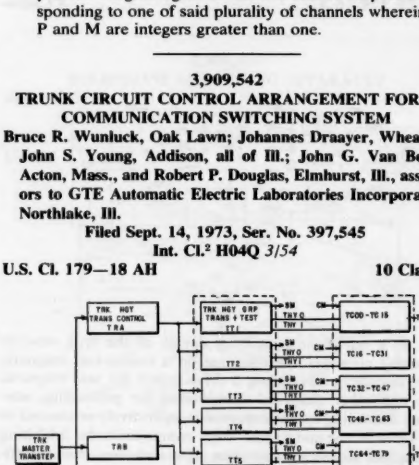
detecting means for identifying any one of N possible framing patterns among the N low-speed bitstreams, said detecting means supplying a signal to said dividing means to shift the P phased outputs thereof in relation to the bits of said N digital bitstreams until the occurrence of one of N framing patterns, said detecting means identifying the framing pattern that does occur which indicates the operating mode of said means for nonsynchronously distributing and in response serving to signal the same to said switching means which in accordance with the operating mode redistributes the bits of the N digital bitstreams to provide a digital signal for each of said M outputs corresponding to one of said plurality of channels wherein N, P and M are integers greater than one.

3,909,542

TRUNK CIRCUIT CONTROL ARRANGEMENT FOR A COMMUNICATION SWITCHING SYSTEM

Bruce R. Wunluck, Oak Lawn; Johannes Draayer, Wheaton; John S. Young, Addison, all of Ill.; John G. Van Bosse, Acton, Mass., and Robert P. Douglas, Elmhurst, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 14, 1973, Ser. No. 397,545
Int. Cl.[2] H04Q *3/54*
U.S. Cl. 179—18 AH **10 Claims**



1. In a communication switching system including a switching network having a plurality of inlets and a plurality of outlets, a plurality of trunk circuits adapted to request the service of common control means for causing the establishment of paths through the switching network from the trunk circuits to predetermined outlets of said switching network, a trunk control arrangement comprising highway control means controlled by said common control means to activate a least one trunk circuit highway for providing control signals to a

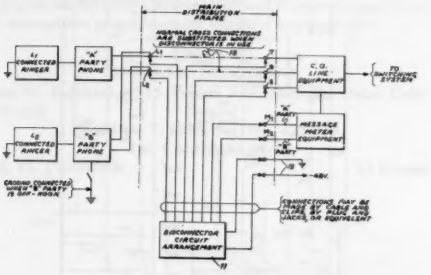
group of said trunk circuits over a plurality of paths common to the trunk circuits of said group and select means controlled by said common control means for effecting the connection of a preselected trunk circuit of said group to the trunk control highway to receive said control signals.

3,909,543

DISCONNECTOR CIRCUIT ARRANGEMENT

Harlan E. Miller, Old San Juan, P.R., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 17, 1974, Ser. No. 434,328
Int. Cl.[2] H04M *3/42*
U.S. Cl. 179—18 B **5 Claims**



1. A disconnector circuit arrangement for use on the central office main distributing frame to selectively disconnect one subscriber in a party line from the central office equipment and couple said one subscriber to a recording means, comprising:

means to select the one subscriber to be placed in an out-of-service condition;

a diode detector means coupled to said select means to detect the one subscriber attempting connection through the central office main distributing frame;

a relay arrangement coupled to said select and detector means and having first means for separating the one subscriber from the central office equipment and second means for simultaneously coupling the one subscriber to a recorded message indicating the out-of-service status, said arrangement including a transistor for holding said one subscriber disconnected and connected to said recorded message as long as said subscriber is off-hook, said transistor coupled in the emitter ground configuration and between said one subscriber and the relay coil of said relay arrangement; and

said relay arrangement including a neon lamp which conducts in response to incoming calls to said one subscriber to enable coupling of the incoming call to another recorded message indicating the out-of-service condition of the one subscriber.

3,909,544

JUNCTOR ALLOTTER

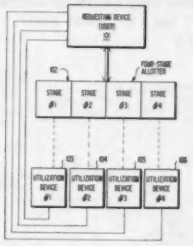
Glenn L. Richards, Caledonia, and Gaetano L. Spiriti, Rochester, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed May 5, 1974, Ser. No. 448,288
Int. Cl. H04m *3/22*
U.S. Cl. 179—18 FD **21 Claims**

1. In a telephone system having a plurality of junctors, to individual ones of which a request for connection may be allotted, a junctor allotter, which, in response to an allotment request, enables a free junctor to be allotted for connection, said junctor allotter comprising:

a plurality of stages, each of which is associated with a respective junctor, for which a connection request can be made, each stage including

first means for storing information representative of the free or busy state of the junctor associated with that stage and, in response to a request for a connection with a junctor, for providing a first signal representative of whether or not the junctor associated with that stage is free; and



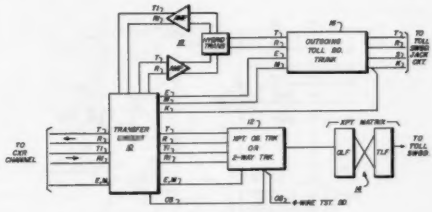
second means, responsive to said connection request, and in response to the condition that the junctor associated therewith is not free, for transferring said request to another stage.

3,909,545

EMERGENCY TRANSFER CIRCUIT FOR USE IN A COMMUNICATION SWITCHING SYSTEM

Siegfried H. Fuchs, Chicago, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 2, 1974, Ser. No. 466,429
Int. Cl. H04m *7/06*
U.S. Cl. 179—27 G **7 Claims**



1. In combination with a communication system having a toll switchboard connectible through a switching network to an outgoing trunk circuit extending towards a distant office and having transmission leads and signaling leads, an emergency transfer circuit for permitting an operator to extend a call to the distant office via a toll switchboard trunk circuit in the event of a malfunction in said switching network comprising first relay means operable upon seizure of said toll switchboard trunk circuit by the operator to couple the transmission leads of said toll switchboard trunk circuit with said transmission leads of said outgoing trunk circuit, second relay means operable by the operator after the operation of said first relay means to open the signaling leads of said outgoing trunk circuit to thereby indicate a disconnect and hence cause the switch train in the distant office to release, said second relay means further being operable to couple one of the signaling leads of said outgoing trunk circuit to a third relay means, the distant office upon switch train release, causing return of a signal on said one signaling lead to operate said third relay means, said third relay means in operating connecting the signaling leads of said outgoing trunk to the signaling leads of said toll switchboard trunk circuit for use by the operator in extending the emergency call.

3,909,546

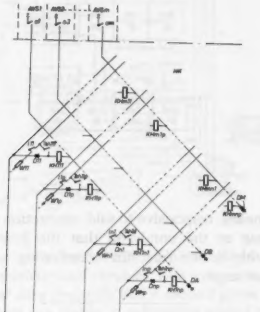
ARRANGEMENT FOR CONNECTING EXCHANGE LINES TO SWITCHBOARDS IN TELEPHONE SYSTEMS

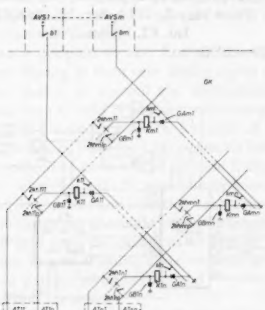
Hans-Dieter Siebel, Munchingen, and Hermann Schlund, Bissingen, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 110,161, Jan. 27, 1971, abandoned. This application May 14, 1973, Ser. No. 359,993

Int. Cl.[2] H04M *3/60*

U.S. Cl. 179—27 FA 2 Claims





1. A circuit arrangement for connecting *m* exchange links to *n* switchboards, comprising a relay switching network in a telephone system, the switching network including a main matrix and an auxiliary matrix, the main matrix including *m* . *n* crosspoint relays each of which includes a plurality of contacts, the auxiliary matrix including *m* . *n* . *p* crosspoint relays each of which includes a plurality of contacts which is fewer in number than the contacts of the main matrix crosspoint relays, where *p* represents the number of control lines per switchboard position via which each of a plurality of exchange links can be reached, means responsive to seizure of an exchange link to complete a connection between a potential source and ground through a selected crosspoint relay of the auxiliary matrix, said selected crosspoint relay closing a contact preparing an associated crosspoint relay of the main matrix for operation, and means including a speaking key for completing a connection between a potential source and ground to enable operation of said associated crosspoint relay of the main matrix.

3,909,547

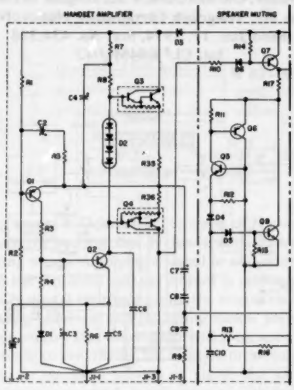
MINE PAGING AND TELEPHONE SYSTEM

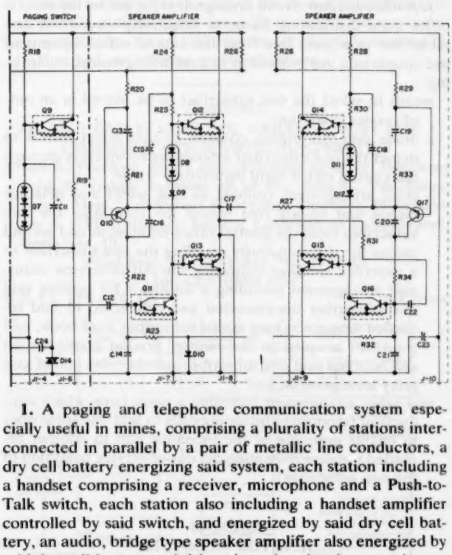
Paul B. Day, Reading, Pa., assignor to Gai-Tronics Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 210,758, Dec. 22, 1971, Pat. No. 3,783,195. This application June 14, 1973, Ser. No. 369,939

Int. Cl.[2] H04M *13/00*

U.S. Cl. 179—40 2 Claims





1. A paging and telephone communication system especially useful in mines, comprising a plurality of stations interconnected in parallel by a pair of metallic line conductors, a dry cell battery energizing said system, each station including a handset comprising a receiver, microphone and a Push-to-Talk switch, each station also including a handset amplifier controlled by said switch, and energized by said dry cell battery, an audio, bridge type speaker amplifier also energized by said dry cell battery and driven by voice signals appearing on said line conductors and comprising a first pair of complementary symmetry transistors connected together at a first mid-point, a second pair of complementary symmetry transistors connected together at a second mid-point, a loud speaker directly connected between said first and second mid-points, a voltage divider comprising a pair of resistors connected together at a third mid-point which is electrically connected to said second mid-point, the other terminals of said speaker amplifier other than those connected to said first, second and third mid-points of said first and second pairs of transistors and of said voltage dividing resistors being connected respectively to said line terminals to provide a double bridge circuit, means for maintaining said first and second mid-points at a

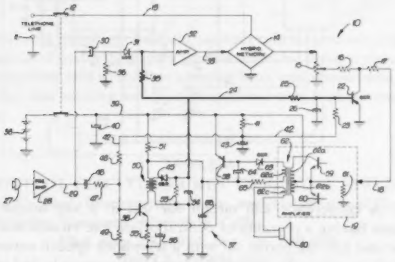
constant voltage value, and a paging circuit having a Push-to-Page switch associated with said handset for applying D.C. bias voltage through said line conductors and line conductors of another station to complete an energizing circuit in said other station to a loudspeaker of said other station and to amplify any voice signals appearing in said line conductors, a release of said Push-to-Page switch removing said bias voltage and deactivating said loudspeaker of said other station and allowing conversation to continue only on said handsets of the respective stations, the entire system becoming dormant upon release of both said handset switches, said entire system, including the connection between said first and second mid-points and loudspeaker, being devoid of large capacitors and inductors that store energy in amounts sufficient for initiating ignition, and means for limiting the paging current to less than 1 ampere under short circuit conditions to prevent ignition in an atmosphere of methane-air mixtures and coal dust.

3,909,548

SPEAKER TELEPHONE

Sava W. Jacobson, 4915 Tyrone Ave., Sherman Oaks, Calif. 91403

Filed Dec. 7, 1973, Ser. No. 422,968
Int. Cl.[2] H04M *1/60*
U.S. Cl. 179—81 B **13 Claims**



12. In a speaker telephone in which audio incoming from a telephone line is amplified by an amplifier, the improvement comprising:

circuit means connecting said telephone line to the input of said amplifier, so that said incoming audio will be amplified by said amplifier only when said amplifier input is not shorted out,

a germanium transistor connected across the input of said amplifier with a dc emitter-to-collector voltage of zero, and

control means for providing base bias to said germanium transistor during speech transmission from said speaker telephone, said bias causing the collector-to-emitter impedance to drop to a level at which the input to said amplifier is effectively shorted out so that said incoming audio will not be amplified by said amplifier during speech transmission.

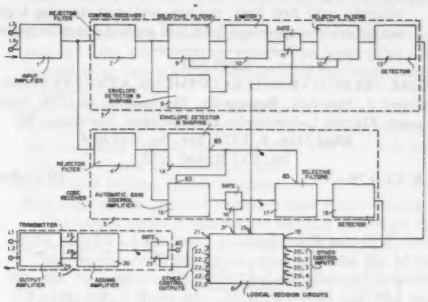
3,909,549

MULTIFREQUENCY SIGNALLING DEVICE AND PARTICULARLY SIGNALLING RECEIVER THEREOF

Andre Tarridec, 21 rue de Trestiniel, Perros-Guirec, France, and Jean Leon Marie Joubert, 28, rue de Treguier, Lannion, France

Filed June 26, 1973, Ser. No. 373,759
Claims priority, application France, June 27, 1972, 72.23909
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—84 VF **10 Claims**

1. A multifrequency signalling receiver comprising a plurality of selective filter means, each selective filter having controlled selectivity tuned to a corresponding one of the signalling frequencies received by the multifrequency receiver, signal envelope detector means coupled with each filter and including a signal envelope detector circuit followed by a shaping circuit for giving a slowly changing leading edge to the output signal from said signal envelope detector means, means for substantially simultaneously applying the input signal received by said signalling receiver to the selective filters and to the said signal envelope detector means, means for applying



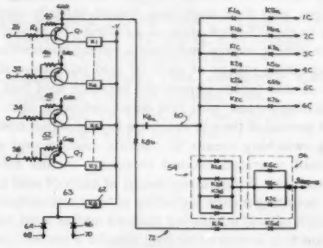
the output signal of said shaping circuit to control the selectivity of the said filters so that a maximum selectivity is attained in each of the filters only when the output signal of the shaping circuit has reached a predetermined amplitude, and decision circuit means for giving an output signal when the output of said receiver coincides with a recognized code.

3,909,550

KEY TELEPHONE SYSTEMS

Ove Villadsen, Wall, N.J., assignor to International Components Corporation, Asbury Park, N.J.

Filed Mar. 28, 1974, Ser. No. 455,950
Int. Cl.[2] H04M *1/26*
U.S. Cl. 179—84 VF **2 Claims**



1. In a receiver unit for a key telephone system having an intercom and external paging mode said receiver unit including a translator circuit for converting frequencies representative of each digit dialed into a corresponding first logic output and which further provides a steering logic output for all digits dialed wherein said key telephone receiver is responsive to said first logic output and said steering logic output in combination such that said receiver connects a called station to a calling station when in said intercom mode after a predetermined number of digits are dialed or connects said calling station to external paging means after a predetermined digit or digits is dialed, each of said first logic outputs connected through corresponding switch contacts to a first common point when the corresponding digit is dialed, and said steering logic output connected to said first common point through corresponding switch contacts whenever any digit is dialed, the improvement which comprises:

a. a second common point having a voltage potential corresponding to a first logic level;

b. a first cutout switch contact connected in series between

said first common point and said second common point; and

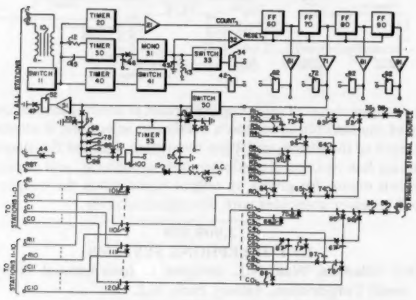
c. means responsive to the dialing of said predetermined number of digits or said predetermined digit, for operating said first cutout switch contact, such that said cutout switch contact is opened after said predetermined number of digits or said predetermined digit is dialed, whereby said first logic outputs and said steering logic output are disconnected from said second common point.

3,909,551

DIAL SELECTIVE INTERCOMMUNICATION SYSTEM

Richard A. Marshall, Bensenville, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 4, 1974, Ser. No. 447,614
Int. Cl.² H04M 1/52
U.S. Cl. 179—99 **10 Claims**



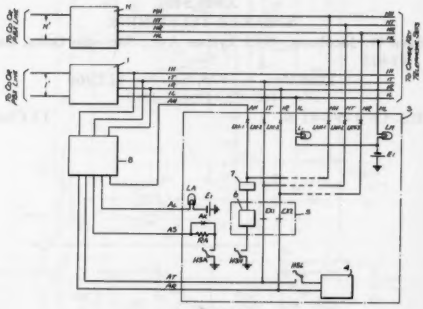
1. An intercommunicating telephone system comprising: a first plurality of dial telephone stations each equipped with a ringer and visual indicating means; a plurality of timers; first switching means connected between all of said stations and said timers, said first switching means initially operated in response to the off-hook state of a calling one of said stations; second switching means including a circuit connection to said visual indicating means at each of said telephone stations; a first one of said timers connected between said first and second switching means, said first timer operated after a predetermined period of time in response to said initial operation of said first switching means to operate said second switching means; said operated second switching means effective to operate said visual indicating means at each of said telephone stations; counting means including at least one circuit connection to each of said telephone stations and at least one circuit connection to a source of ringing signals; a second one of said plurality of timers connected between said first switching means and said counting means, said second timer operated after a predetermined period of time in response to said initial operation of said first switching means, to prepare an operating path to said counting means; said first switching means further operated in response to each dial pulse transmitted from a calling one of said telephone stations; said counting means operated in response to each further operation of said first switching means to count the number of dial pulses transmitted by said calling station and prepare a circuit connection between said ringing signal source and a called one of said stations; said first switching means finally operated in response to completion of dial pulses by said calling station; a third one of said timers operated after a predetermined period of time in response to said final operation of said first switching means; third switching means including at least one circuit connection between said ringing signal source and said counting means; a monostable circuit connected between said third timer and said third switching means, operated in response to said third timer operation to generate an output signal for a predetermined time to said third switching means; said third switching means operated in response to said monostable circuit to complete a circuit connection from said ringing signal source through said counting means to said called station for a predetermined period of time; ringing signals transmitted by said ringing signal source over said completed connection to said called station to render said ringer at said called station operated for a predetermined period of time.

3,909,552

CONFERENCE CALL CIRCUIT FOR USE IN A KEY TELEPHONE SYSTEM

Stephen E. Kerman, Merrick, N.Y.; Tsuyoshi Shinoi, and Tsutomu Kataoka, both of Kawasaki, Japan, assignors to Nippon Tsu Shin Kogyo K.K., Japan and TIE/Communications, Inc., Stamford, Conn.

Filed Oct. 9, 1973, Ser. No. 404,204
Int. Cl.² H04M 1/00
U.S. Cl. 179—99 **8 Claims**



1. A conference call circuit for use in a key telephone system having a plurality of central office line circuits and at least one key telephone set with a telephone speech network circuit, in which the system is adapted to connect to and hold a first line circuit means while connecting a second line circuit means to the key telephone speech network, the conference call circuit means comprising:

a relay circuit means for connecting and disconnecting the speech network circuit of the key telephone to the second line circuit means,

a relay control means for controlling the operation and release of the relay, comprising a non-locking key means in combination with a first semiconductor switching means responsive to said non-locking key means, and a second semiconductor switching means, responsive to the output of said first semiconductor switching means, the output of said second semiconductor switching means controlling the operation and release of the relay, said relay means having a plurality of contacts for connecting the key telephone set to the second line circuit means,

said relay control means operating the relay means when the key means is depressed to contact a holding circuit means and a speech path circuit means to the second line circuit means, and

said relay control means releasing the relay means when the key means is depressed a second time to disconnect the holding circuit means and the speech path circuit means from the second line circuit means.

3,909,553

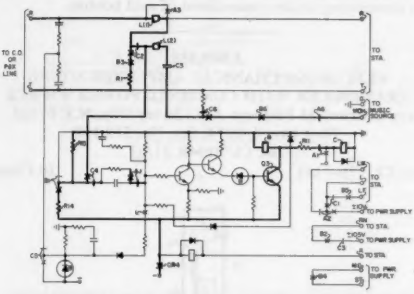
LINE CARD FOR KEY TELEPHONE SYSTEMS ADAPTED TO PROVIDE MUSIC DURING HOLD CONDITION

Richard A. Marshall, Bensenville, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 1, 1974, Ser. No. 456,937
Int. Cl.² H04M 1/21
U.S. Cl. 179—99 **3 Claims**

1. A key telephone line card initially operated to connect a

subscriber's key telephone station instrument to a telephone line, and further operated in response to said station instrument to disconnect said instrument from said telephone line, and connect a holding circuit across said telephone line, said telephone line card including: a line relay including a first winding and a second winding initially connected serially across said telephone line; a plurality of relays operated in response to said telephone instrument hold signal to disconnect said first and second windings serially connected across said line and connect said first winding in said holding circuit



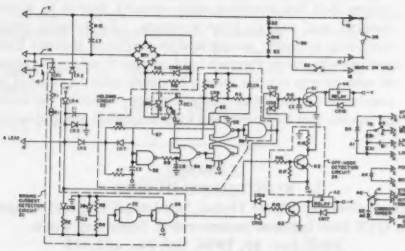
across said telephone line and connect said second winding to a source of audio frequency signals; whereby audio frequency signals from said source are coupled from said second winding to said first winding and then transmitted over said connected line.

3,909,554

CONTROL CIRCUIT FOR KEY TELEPHONE SYSTEM

John M. Reed, Breckenridge, Colo., assignor to Lordel Manufacturing Company, Monrovia, Calif.

Filed Aug. 23, 1974, Ser. No. 500,030
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—99 **7 Claims**



1. In combination in a key telephone system, a control circuit comprising

a telephone line pair connected to a telephone switching office and to a key telephone set receiver,

a ringing current detection circuit responsive to ringing current on said line pair for generating a first control signal,

an off-hook detection circuit responsive to a certain signal being applied to the A lead associated with said line pair for generating a second control signal,

a holding circuit responsive to the coincidence of the application of said certain signal to the A lead and the flow of current in at least one line of said line pair, followed by the removal of said certain signal from the A lead, for generating a third control signal,

first relay means operable in response to either said first or third control signals,

second relay means operable in response to either said second or third control signals,

means for applying current from a current supply to the interrupter motor of the key telephone system, for applying lamp-flash current from a current supply to the key telephone system line lamp associated with said line pair, and for applying ringer or buzzer current from a current supply to the ringer or buzzer of the key telephone system when said first relay means is operated and said second relay means is unoperated,

means for applying steady-lamp current from a current supply to the key telephone system line lamp when said second relay means is operated and said first relay means is unoperated, and

means for conducting current between said line pair and for applying lamp-wink current from a current supply to the key telephone system line lamp when said first and second relay means are operated, and

wherein said holding circuit includes

first logic means coupled to said A lead for producing a first logical signal if said certain signal is placed on the A lead for longer than a predetermined period of time, line current detecting means coupled to one line of the pair for producing a second logical signal substantially immediately when line current flows in said one line and for producing a third logical signal if the line current flows in said one line for longer than a certain period of time,

second logic means responsive to the coincident production of said first, second and third logical signals for producing a fourth logical signal, and

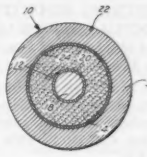
binary latch means responsive to the removal of said certain signal from the A lead and production of said third and fourth logical signals for generating said third control signal.

3,909,555

PHASE STABLE TRANSMISSION CABLE WITH CONTROLLED THERMAL EXPANSION CHARACTERISTICS

Dewey F. Harris, Monument, Colo., assignor to Kaman Sciences Corporation, Colorado Springs, Colo.

Filed Oct. 16, 1974, Ser. No. 515,307
Int. Cl.[2] H01B *3/02, 5/00, 11/06*
U.S. Cl. 174—102 P **9 Claims**

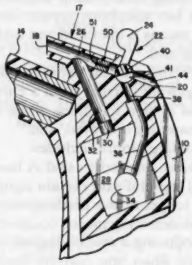


1. A high temperature electrical length stable radio frequency cable comprising a center conductor, a spaced concentric conductive sheath and a dielectric insulating medium between said sheath and center conductor wherein the center conductor is comprised of a core of a metal or metal alloy of low coefficient of thermal expansion with a relatively thin outer layer of low electrical resistivity metal bonded thereto and the sheath comprises a hollow tubular member of a metal or metal alloy of low coefficient of thermal expansion with a relatively thin bonded of low electrical resistivity metal vonded to the inside thereof and wherein the dielectric material is selected from the group consisting of silica, magnesia and alumina.

3,909,556
DIRECTIONALLY VARIABLE HEARING AID

Donald L. Johanson, Wayland, Mass., assignor to Audivox, Inc., Newton, Mass.

Filed Aug. 8, 1974, Ser. No. 495,837
Int. Cl.² H04R 25/00
U.S. Cl. 179—107 FD 7 Claims

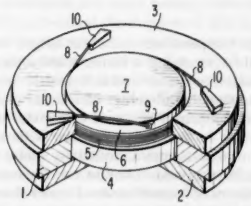


1. A hearing aid comprising:
a differential transducer having first and second sound receiving ports;
a housing having a forwardly facing sound receiving aperture and a rearwardly facing sound receiving aperture;
a first sound receiving path between said forwardly facing aperture and said first transducer port;
a second sound receiving path distinct from said first sound receiving path for selectively coupling said second receiving port to said first or second sound receiving apertures and including
control valve means operative in a first position to couple sound energy received by said rearwardly facing aperture to said second sound receiving port, and in a second position to couple sound energy received by said forwardly facing aperture to said second sound receiving port;
acoustic filter means in said second sound receiving path only when said valve means is in said second position;
electronic circuitry for amplifying and processing sound information received by said transducer; and
an earpiece coupled to said circuitry and adapted to the ear of a user.

3,909,557
VIBRATION DAMPENING MOUNTING SYSTEM FOR WIRE SUSPENDED LOUDSPEAKER BOBBIN

Shouzo Kinoshita, and Shinichi Ishikawa, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed June 14, 1973, Ser. No. 370,189
Claims priority, application Japan, June 20, 1972, 47-72182
Int. Cl.² H04R 9/04
U.S. Cl. 179—115.5 VC 1 Claim

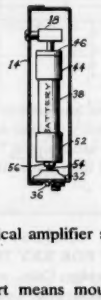


1. In a loudspeaker including an annular fixed magnetic plate partially forming a magnetic circuit and partially defining with its inner periphery, a cylindrical air gap, and a cylindrical bobbin having a voice coil wound about its periphery and being suspended within said cylindrical air gap by means of a plurality of suspension wires which extend tangentially to the outer periphery of the bobbin in the same direction and are fixed at their inner end to the bobbin and at their outer end to said annular plate at respective circumferentially spaced positions, the improvement comprising: a mass of viscous resilient damping material surrounding the outer end of each wire and solely fixing each wire outer end to said annular plate for suppressing movement of said wires along their axes and for dampening rotative movement of said bobbin.

3,909,558
ELECTROMECHANICAL AMPLIFIER SOUND TRANSDUCER WITH COMBINED POWER SOURCE

Jerry O'Brien, 33 Pamrapo Ave., Jersey City, N.J. 07305

Filed Oct. 7, 1974, Ser. No. 512,190
Int. Cl.² H04R 21/02
U.S. Cl. 179—141 10 Claims



1. An electromechanical amplifier sound transducer comprising:
a. housing means;
b. conductive support means mounted on said housing means;
c. electric energy source means; and
d. mechanically loose coupling means for conductively connecting said energy source means to said support means and for enabling said support means to loosely support said energy source means, said housing means receiving acoustic waves and in response thereto transmitting vibrations through said conductive support means to said energy source means to cause interruptions of the conductive connection therebetween, whereby the acoustic waves can be converted into amplified electric waves.

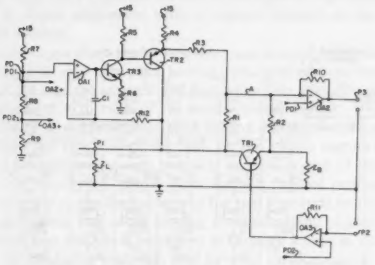
3,909,559
ELECTRONIC HYBRID

Michael Geoffrey Cleeve Taylor, Maidstone, England, assignor to GTE International Incorporated, Stamford, Conn.

Filed Apr. 19, 1974, Ser. No. 462,469
Claims priority, application United Kingdom, July 3, 1973, 31712/73
Int. Cl.² H04B 1/58; H04M 3/56
U.S. Cl. 179—170 NC 6 Claims

1. An electronic hybrid circuit for connecting a signal transmitting circuit and a signal receiving circuit to a two-way signal transmission circuit, said circuit comprising:
constant current supply source means for providing current supply terminals for connection to said two-way signal transmission circuit;
a signal control transistor, a line balance load impedance connected in series with the current path of said signal control transistor, said current supply terminals connected across the series combination of said signal control transistor current path and said balance impedance; and
a signal summation circuit having inputs connected respectively at opposite sides of the current path of said signal control transistor, said signal summation circuit includes

a series impedance element in each of said inputs connected respectively at opposite sides of the current path of said signal control transistor and wherein said signal transmitting output of said summation circuit is formed by the junction of said two series impedance elements, the arrangement being such that with a signal receiving circuit connected to provide a control signal to a current control electrode of said transistor, and a signal transmitting circuit connected to receive an output from said



signal summation circuit, signal voltages generated across the impedance presented to said supply terminals in response to receipt of signals by said two-way transmission circuit or transmission of signals from said signal receiving circuit are fed to said signal transmitting circuit via said signal summation circuit, the signal voltages generated by said signal receiving circuit being at least partially cancelled in the summation circuit by corresponding signal voltages generated in phase opposition across said line balance load impedance.

3,909,560

METHOD AND SYSTEM FOR PROVIDING POWER TO BOOSTER AMPLIFIERS IN H.F. CABLE NETWORK

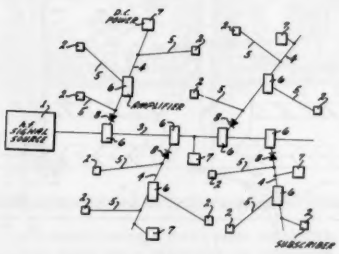
Helmut Martin, Hannover, and Lothar Krisch, Misburg, both of Germany, assignors to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Mar. 5, 1974, Ser. No. 448,265

Claims priority, application Germany, Mar. 5, 1973, 2310885

Int. Cl.² H04B *3/44*

U.S. Cl. 179—170 J **2 Claims**



1. In a network for transmitting high frequency signals via cable from a source to multiple users at different locations, the network being organized in several levels including a primary level, into which the h.f. signals are fed, secondary levels branching off the primary level, and lower levels including user levels branching off the secondary levels and into which the signals are to be distributed, and wherein booster amplifiers for the h.f. signals are included in the network, comprising:

a plurality of power regulation units respectively individually associated with and connected to said amplifiers for powering the respective amplifier with regulated d.c. and constructed for connect-disconnect switching as between the d.c. supply line of the network the respective amplifier; and

a plurality of d.c. power supply means smaller in number than the plurality of units, and each for feeding d.c. into the network, the power supply means of the plurality being located at several different, spaced apart locations along the network so that d.c. is fed into the network at the said different and spaced apart locations whereby each said power supply means provides a d.c. voltage to several of said power regulation units, and each said power supply means provides electric power for amplifiers in a portion of the network accordingly and over a distance in the network signficantly smaller than the network as a whole; and

means included in the network for preventing d.c. supply current from flowing from a secondary level into the primary level, each secondary level connected to at least one of said supply means of the plurality, the primary level connected separately to at least one of said supply means.

3,909,561

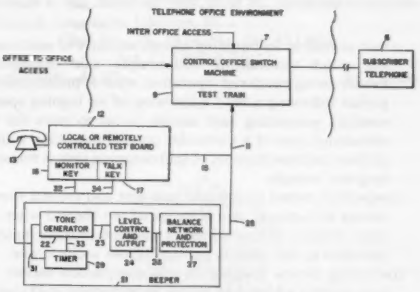
CIRCUIT USE WARNING DEVICE

Barry H. Dent, Concord, Calif., assignor to Badger Meter, Inc., Richmond, Calif.

Filed Mar. 18, 1974, Ser. No. 451,760

Int. Cl.² H04M *3/22*

U.S. Cl. 179—175.2 C **1 Claim**



1. In a circuit use warning device comprising a voice communication circuit, a test circuit, selector means for connecting said test circuit to said voice communication circuit and a warning signal emitter, the improvement comprising means for connecting said emitter in said test circuit to furnish warning signals to said communication circuit, and means responsive to operation of said selector means for withholding said signals for a predetermined time after operation of said selector means.

3,909,562

SWITCHING NETWORK TESTING PROCESS AND ARRANGEMENT

Jean Paul Lager, La Celle St. Cloud, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 12, 1974, Ser. No. 505,295

Claims Priority, application France, Oct. 5, 1973, 73.35679

Int. Cl.² H04M *3/24;* **H04J** *3/14*

U.S. Cl. 179—175.2 R **10 Claims**

2. A testing arrangement for a multistage time-division switching network comprising:

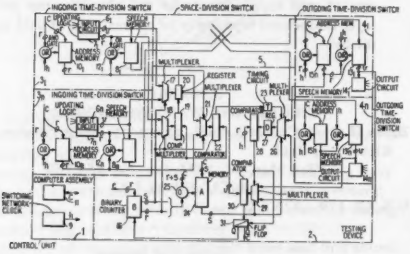
a switching network control computer assembly;

a control addressing means coupled to said assembly capable of providing for each control operation a binary input address of a sample from which a duplicate sample is derived for comparison purposes;

first storage means coupled to said assembly to store in a special memory row an address of an outgoing time-division switch which is selected for transmitting said sample as soon as said address of said outgoing switch is provided from said assembly when establishing a communication connection involving said sample, said special memory row having said address of said sample input address;

second storage means coupled to said control addressing means to store for the duration of a control operation a duplicate of said sample stored in an ingoing speech memory of an ingoing time-division switch addressed by said control addressing means at a time-division address identical to the address provided by said control addressing means;

means for determining coupled to said outgoing switch, said determining means determining a time-division address of



said sample in an outgoing speech memory of said outgoing switch transmitting said sample, said determining means being rendered operative after a predetermined period following a read addressing of an ingoing speech memory processing said sample so as to store for the remaining time of a particular control operation a time-division address memory of said outgoing switch transmitting said sample;

comparison means coupled to said first and second storage means to compare said samples stored therein when the time-division address stored in said determining means is identical to the address provided from a clock; and

translating means coupled to said comparison means and said control addressing means to increment said control addressing means in response to the output signal of said comparison means at the end of each control operation.

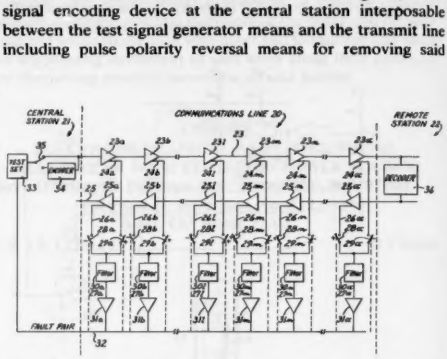
3,909,563

PROCEDURE AND APPARATUS FOR LOCATING FAULTS IN DIGITAL REPEATERED LINES

Suhas Ghosh, Naperville, and Michael Francis Wicnienski, Joliet, both of Ill., assignors to Wescom, Inc., Downers Grove, Ill.

Filed Nov. 6, 1973, Ser. No. 413,363
Int. Cl.[2] H04B *3/46*
U.S. Cl. 179—175.31 R **18 Claims**

1. In a communications system the combination comprising a central station, a remote station a transmit line extending from the central station to the remote station, a receive line extending from the remote station to the central station, two transmit sets of repeaters serially connected in the transmit line at spaced positions, two receive sets of repeaters serially connected in the receive line at spaced positions, means including a test signal generator at the central station for selectively generating a predetermined limited number of test signals and for applying the test signals to the transmit line, the test signals being in the form of bipolar pulse trains having bipolar violations therein for imparting respective frequency characteristics to said test signal, a fault line extending from all of the repeaters to the central station, each set of repeaters being respectively connected to the fault line via a corresponding set of band pass filters tailored to pass respective ones of the frequency characteristics, means at the central station for applying a "set selector" signal to the fault line and including responsive means at the repeaters for enabling the repeater sets in the respective lines to respond separately to the test signals thereby doubling the number of repeaters which can be tested with the same set of test signals, a test signal encoding device at the central station interposable between the test signal generator means and the transmit line including pulse polarity reversal means for removing said



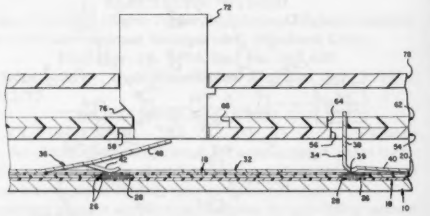
bipolar violations and encoding the test signals into a disguised form free of said frequency characteristics, and a test signal decoding device at the remote station interposable between the transmit line and the receive line for reconverting the encoded test signals into test signals of directly usable form including said bipolar violations and the respective frequency characteristics imparted thereby, so that by interposition of the encoder and decoder a total number of repeaters can be tested using the same fault line which is four times as great as the available number of test signals.

3,909,564

KEYBOARD ASSEMBLY WITH FOLDABLE PRINTED CIRCUIT MATRIX SWITCH ARRAY, AND KEY ACTUATOR LOCKING SLIDE PLATE

William Samuel Scheingold, Palmyra; Harold Lawrence Purdy, Hummelstown, and Frank Christian Youngfleish, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 8, 1974, Ser. No. 495,709
Int. Cl.[2] H01H *9/20, 13/00;* **G06F** *3/02*
U.S. Cl. 200—5 E **1 Claim**



1. A keyboard assembly comprising:

a. a flat flexible cable with a portion thereof folded back over on itself and having contacts deposited on both facing surfaces, contact on one surface being directly across from contacts on the other surface;

b. means for connecting the contacts into electrical circuits;

c. a layer of insulating material positioned between the two contact-carrying surfaces and having holes therethrough, said holes being in registration with opposing contacts;

d. a switch plate overlying the folded over cable and containing a plurality of resilient switch members comprising an elongated limb extending obliquely upwardly and a pair of fingers, one on either side of the limb, extending obliquely downwardly with the free end of each finger being adjacent an outside surface of the folded over cable and in direct alignment with a contact located on the inside surface, said plate further containing a plurality of commoning members comprising an L-shaped strip of material having a vertical arm and an elbow, said elbow being adjacent an outside surface of the folded over cable and in direct alignment with a contact located on the inside surface;

e. a slidable cam plate positioned over and spaced from the switch plate, said cam plate having a plurality of slots into which the vertical arms extend and a plurality of openings in alignment with each of the switch members;

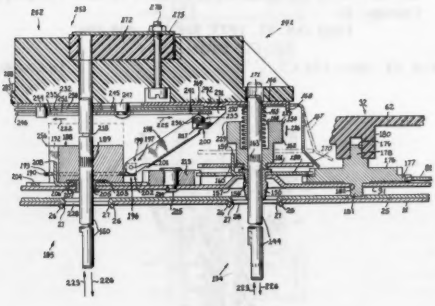
f. a plurality of movable keys each having a bottom surface adjacent the free end of the limb on the switch member and a beveled surface on one side so that as one of the keys are depressed, the bottom surface thereof pushes downwardly on the limb whereby the two free ends on the fingers pushes the cable forcing the underlying aligned contacts into electrical engagement through a hole in the layer of insulating material, said beveled surface concurrently pushing on and laterally sliding the cam plate such that the arms of the commoning members extending through the slots are rotated about the point of attachment with the switch plate so that the elbows drive the underlying contacts into electrical engagement through the holes in the insulating layer.

3,909,565

AUTOMATIC TIMER SWITCH

Michael T. Clouser, and Bruce W. Shell, both of Indianapolis, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Apr. 29, 1974, Ser. No. 464,760
Int. Cl.[2] H01H *43/00*
U.S. Cl. 200—38 R **5 Claims**



1. In a timer switch having a frame plate, an electric motor carried by said frame plate, a time-of-day indicating means coupled to said motor, and a mechanically-actuated electrical switching means carried by said frame plate for switching electrical current including a plurality of electrical contacts, the improvement comprising:

a. a manually-settable, rotatable start-time means for activating said electrical switching means;

b. a manually-settable, rotatable stop-time means for activating said electrical switching means including:

i. a stop shaft axially displaceable and rotatable in said frame plate.

ii. a stop gear carried about said stop shaft having a first engagement means,

iii. a stop hub carried by said stop shaft having a second engagement means engaging said first engagement means; and

iv. linkage means mechanically linking said switch means to said stop hub including:

an annular groove disposed in said stop hub;

a yoke member having a first aperture and two side-by-side prongs, said prongs carried in said annular groove of said stop hub;

a link member having second and third apertures, each disposed near a distal end of said link member;

a first linkage pin located in said first aperture in said yoke member and said second aperture in said link member, thereby forming a pivotal joint; and

a second linkage pin passing through said third aperture in said link member and an aperture in said mechanical-actuated electrical switching means, thereby forming a pivotal joint;

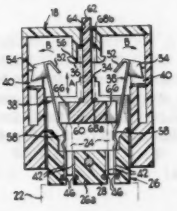
whereby, axial movement of said stop hub is transmitted by said yoke member through said link member to said mechanically actuated electrical switching means thereby actuating said switching means.

3,909,566

ELECTRICAL SAFETY SOCKET WITH MONABLE CONTACT ELEMENTS

Howard J. Morrison, Deerfield; Albert G. Keller, Chicago, and Donald F. Nix, Hanover Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 10, 1974, Ser. No. 432,420
Int. Cl.[2] H01R *19/52*
U.S. Cl. 200—51.07 **16 Claims**

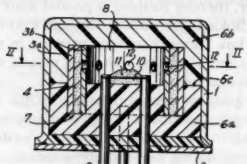


1. An electrical plug safety socket construction for use in combination with a standard electrical plug having a pair of prong members for conducting electricity, comprising: a housing, fixed electrical contact means in said housing, movable receptacle means in said housing for receiving the prong members of the electrical plug and movable between an inner limit position and an outer limit position relative to the housing, movable electrical contact means carried by said receptacle means and disposed within said housing and normally disposed out of engagement with the fixed contact means when said receptacle means is in said inner limit position and disposed in engagement with the fixed contact means when said receptacle means is in its outer limit position, and means on said receptacle means for holding at least one of said prong members when the prong member is inserted into the receptacle means whereby partial withdrawal of the plug member out of the housing causes the receptacle means to move therewith to said outer limit position moving the movable contact means therewith into engagement with the fixed contact means to complete an electrical circuit therethrough.

3,909,567
ELECTRICAL RELAY CONTAINING A PYROTECHNICAL CHARGE AND HAVING NO MOVING PARTS

Jacques C. Delgendre, Toulon; Emile F. Hamon, La Seyne-sur-Mer, and Georges A. Berton, Toulon, all of France, assignors to Etat Francais, Paris, France

Filed Mar. 18, 1974, Ser. No. 452,373
Claims priority, application France, Mar. 19, 1973, 73.09657; Feb. 25, 1974, 74.06263
Int. Cl.² H01H 39/00
U.S. Cl. 200—61.08 26 Claims

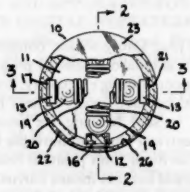


1. A static relay comprising two spaced metallic electrodes which are electrically isolated from one another, a coating of a layer of tin on said electrodes, a first pyrotechnical composition disposed between said electrodes, a second pyrotechnical composition separated from the first pyrotechnical composition, means for initiating combustion of the second pyrotechnical composition by application of an electrical signal, said first composition being so disposed with respect to the second composition to be initiated by the reaction thereof, said first composition being so constituted as to form a conductive body, under the heat released by the reaction of the first composition, which effects welding of the metallic electrodes together.

3,909,568
IMPACT MONITOR OR SHOCK INDICATOR

Bart E. Greenhut, Pepper Pike, Ohio, assignor to Impact-O-Graph Corporation, Bedford, Ohio

Filed Mar. 28, 1974, Ser. No. 455,549
Int. Cl.² H01H 9/00
U.S. Cl. 200—61.45 19 Claims

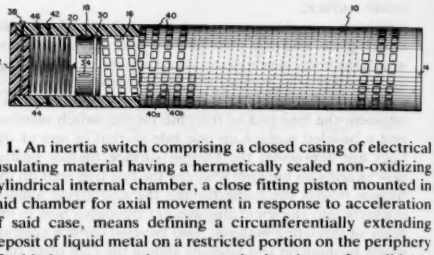


1. In a stock indicator, the combination of a base, a pair of diametrically opposed upstanding support arms carried by said base and yieldably movable relatively thereto, a ball seat element slidably mounted in each of said arms, a ball resting in each of said ball seats, a calibrated spring yieldably retaining said balls in said seats, and means establishing a fixed operative spacing between said ball seats independently of displacement of said support arms to provide a predetermined monitoring level of impact force, whereby said balls are dislodged from said seats in response to an impact force exceeding said monitoring level.

3,909,569
INERTIA SWITCH HAVING MOVABLE LIQUID CONTACT MEDIUM RETAINED IN RECIPROCATING ACTUATOR AND ENGAGING HELICAL FIXED CONTACT ARRAY

W. Dale Jones, 7020 Aztec Rd., N.E., Albuquerque, N. Mex. 87110

Filed July 19, 1974, Ser. No. 490,200
Int. Cl.² H01H 35/18, 29/00
U.S. Cl. 200—61.53 12 Claims

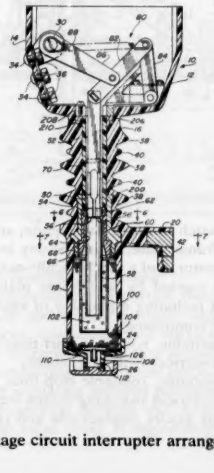


1. An inertia switch comprising a closed casing of electrical insulating material having a hermetically sealed non-oxidizing cylindrical internal chamber, a close fitting piston mounted in said chamber for axial movement in response to acceleration of said case, means defining a circumferentially extending deposit of liquid metal on a restricted portion on the periphery of said piston to constitute an annular bearing surface slidably supporting said piston, and a plurality of axially extending rows of axially spaced electrical contacts fixedly embedded in said casing and having inner surfaces flush with the inner wall of said chamber in axial alignment with said deposit of liquid metal to be slidably engaged and electrically contacted by said deposit during movement of said piston along said chamber, said rows of said contacts being circumferentially spaced from each other with said contacts of any one said row being uniformly axially offset from said contacts of adjacent said rows to produce a generally helical arrangement of said contacts about the axis of said casing.

3,909,570
HIGH VOLTAGE CIRCUIT INTERRUPTER SWITCH ARRANGEMENT

Robert H. Harner, Park Ridge, and Thomas J. Tobin, Morton Grove, both of Ill., assignors to S and C Electric Company, Chicago, Ill.

Filed Oct. 11, 1973, Ser. No. 405,496
Int. Cl.² H01H 33/04
U.S. Cl. 200—144 C 18 Claims



1. A high voltage circuit interrupter arrangement for inter-

rupting current flow between two electrical circuits comprising:

an integrally formed hollow unitary housing formed of an insulating material including:

an operating mechanism enclosing portion having a hollow interior;

an insulator portion having a hollow interior;

a muffler portion having a hollow interior, said hollow interiors of said operating mechanism enclosing portion, said insulator portion and said muffler portion communicating with one another;

stationary contact means mounted within the hollow interior of said insulator portion and electrically connected to one of the electrical circuits;

movable contact means electrically connected to another one of the electrical circuits and mounted for movement within said hollow interiors of said operating mechanism enclosing portion, said insulator portion, and said muffler portion; said movable contact means including a trailer means formed of a material that produces an arc quenching gas upon exposure to an electrical arc;

a cylindrical liner means positioned around the interior of the insulator portion, said liner means formed of a material that produces an arc quenching gas upon exposure to an electrical arc;

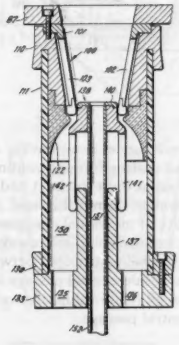
operating means mounted within the hollow interior of said operating mechanism enclosing portion for moving the movable contact means into electrical engagement with the stationary contact means to connect the two electrical circuits and to disconnect out of electrical engagement to a spaced gap position to interrupt current flow between the two electrical circuits.

3,909,571

CONTACT STRUCTURE FOR HIGH VOLTAGE GAS BLAST CIRCUIT INTERRUPTER

Hansruedi Aumayer, Harleysville, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Sept. 19, 1973, Ser. No. 398,871
Int. Cl.² H01H *33/64*
U.S. Cl. 200—148 R **7 Claims**



1. In a circuit interrupter:

an integral, generally tubular stationary contact, one end of said generally tubular contact being segmented in an axial direction to define a generally circular cluster of contact fingers;

an integral, generally tubular movable contact movable into and out of engagement with said stationary contact, one end of said generally tubular movable contact being segmented in an axial direction to define a generally circular cluster of contact fingers, the opposite end of said movable contact being a generally solid ring; said contact fingers extending for the major length of said generally tubular movable contact from said one end of said generally tubular movable contact to said generally solid ring of said generally tubular movable contact;

said tubular stationary and movable contacts being coaxial; said solid ring end of said movable contact being movable into engagement with surfaces of said circular cluster of contact fingers of said stationary contact and having a diameter different than the diameter defined by said surface of said cluster of stationary contact fingers when they are unflexed, thereby to create a given contact pressure when said movable and stationary contacts are in engagement;

a generally stationary conductive tube supported in insulated relation with respect to said stationary contact;

said tubular movable contact being coaxial with respect to said stationary conductive tube and being in sliding contact engagement therewith; said segmented movable contact fingers engaging a surface of said conductive tube; said conductive tube having a diameter different than the diameter defined by the engaging surfaces of said movable contact fingers when they are unflexed, thereby to create a given contact pressure when said movable contact slides relative to said conductive tube; whereby contact bounce of said movable contact fingers is substantially eliminated;

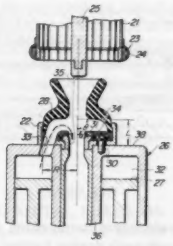
and an operating mechanism for applying high forces over a relatively short time to said movable contact, thereby to move said movable contact into and out of engagement with said stationary contact, and wherein substantially no shock force is transmitted to the region of sliding engagment between said movable contact fingers and said stationary conductive tube when said movable contact moves out of engagement with said stationary contact; said operating mechanism including an elongated operating shaft disposed coaxially with said movable contact and extending through the center of said stationary conductive tube, and having one end thereof fixed to said solid ring end of said movable contact.

3,909,572

CIRCUIT BREAKING SECTION OF A GAS CIRCUIT BREAKER OF THE PUFFER TYPE

Tohru Tsubaki; Seizo Nakano, and Minoru Sato, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 30, 1974, Ser. No. 502,070
Claims priority, application Japan, Aug. 27, 1974, 49-26444
Int. Cl.² H01H *33/70*
U.S. Cl. 200—148 A **6 Claims**



1. A circuit breaking section of a gas circuit breaker of the puffer type comprising:

a. a hollow main fixed contact including a plurality of conductive pieces arranged in the form of a circle,

b. a fixed arc contact of the block shape arranged concentrically in a hollow space of said main fixed contact,

c. a movable cylinder disposed in juxtaposed relation with said hollow main fixed contact,

d. a side wall closing one end of said movable cylinder which is juxtaposed against said hollow main fixed contact,

e. a hollow cylinder rod disposed concentrically with and extending through said movable cylinder, said hollow cylinder rod being attached to said side wall,

f. a fixed piston disposed in said movable cylinder for cooperation therewith,

g. a movable hollow arc contact disposed in juxtaposed relation with said fixed arc contact and supported in said hollow cylinder rod,

h. a nozzle made of an insulating material disposed concentrically with said movable hollow arc contact and mounted on said side wall, said nozzle made of an insulating material being formed on its downstream side with an orifice of a diameter large enough to permit said fixed arc contact of the block shape to move therethrough,

i. a main movable contact mounted on outer periphery of said nozzle made of an insulating material and disposed concentrically therewith so as to be brought into and out/of sliding contact with said hollow main fixed contact, said main movable contact being electrically connected to said side wall, and

j. a plurality of gas supply ports formed in said side wall for permitting a pressurized gas produced in a chamber defined in said movable cylinder between said side wall and said fixed piston to pass therethrough and move toward the downstream side of said nozzle made of an insulating material as said movable cylinder is operated,

such circuit breaking section being characterized in that said nozzle made of an insulating material has an inner wall which is shaped that, when the circuit breaker is in a full open position in which the main fixed contact and the main movable contact are out of contact with each other, the resistance offered to a stream of gas moving from said plurality of gas supply ports toward the bore of said movable hollow arc contact is equal to or greater than the resistance offered to a stream of gas moving from said plurality of gas supply ports through the orifice of said nozzle made of an insulating material toward the downstream side thereof.

3,909,573

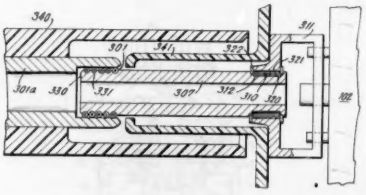
SQUEEZE COIL PRIMARY DISCONNECT CONTACTS

George A. Wilson, Pineville, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 24, 1974, Ser. No. 463,727

Int. Cl.² H01H 1/46

U.S. Cl. 200—258 **4 Claims**



1. In drawout switchgear, comprising a device for opening and closing a circuit; said device having a pair of terminals;

disconnect contact assemblies each comprising a stationary disconnect contact;

and a movable disconnect contact arm connected to one of said terminals;

said movable disconnect contact arm comprising:

resilient contact members mechanically and electrically connecting one end of said conductor to one of said terminals;

said conductor having limited omnidirectional movement at said connected end thereof;

and additional contact elements on the end of the conductor opposite the end thereof connected to said terminal; said additional contact elements being engageable with said stationary disconnect contact;

said omnidirectional movement of said conductor at its connection to said terminal permitting the additional contacts at the opposite end to be aligned with said stationary disconnect contact,

the said first mentioned resilient contact members comprise:

a plurality of helical spring turns; each of said helical spring turns being wound as a helical spring around an end of said conductor;

said terminal having a cylindrical recess receiving said end of said conductor; said cylindrical recess and said end of said conductor being spaced so that the helical spring members are compressed between them transverse to the main axis of the spring members;

said alignment and universal movement of said conductor compressing said springs further on one side and correspondingly reducing the degree of compression on the opposite side while maintaining the electrical and mechanical connection between said conductor and said terminal.

3,909,574

MICROWAVE TUNNEL-OVENS

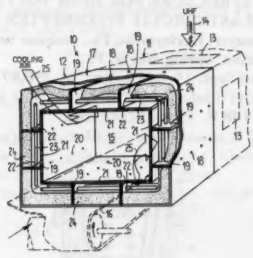
Paul Curt Muller, Felsenau, Germany; Niklaus Kehl, and Egon Kreis, both of St. Gallen, Switzerland, assignors to Kreis AG, Switzerland

Filed Mar. 28, 1974, Ser. No. 455,538

Claims priority, application Switzerland, Apr. 11, 1973, 5182/73

Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 A **8 Claims**



1. In a microwave tunnel-oven having absorption sections enclosed by a metal casisng forming continuations of a central passage of said oven at both the inlet and outlet ends of said oven, the improvement comprising said absorption sections including a plurality of individual elongated load members of a ferrite material for absorbing microwaves, said plurality of ferrite load members being arranged between said casing and said continuations of said central passage at a distance next to one another in spaced relationship transversely to said continuations of said central passage.

3,909,575

CHAIN LINK HEAT TREATING APPARATUS AND METHOD

Earl K. Phares, Hammond, Ind., and Alfred H. Lewis, Huntington Woods, Mich., assignors to S. G. Taylor Chain Company, Inc., Hammond, Ind.

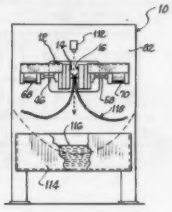
Filed Jan. 31, 1974, Ser. No. 438,256

Int. Cl.² H05B 1/00

U.S. Cl. 219—50 **17 Claims**

1. An apparatus for heat treating a single link which is connected in a chain made up of a plurality of chain links, comprising a pair of spaced apart electrodes, said electrodes

defining clamp means for clamping a single chain link in position to span the gap between the electtodes with the body of the link being substantially centered relative to the electrodes and being confined thereby, means for supplying electrical power to the electrodes whereby current is passed through said body of the link for heating of the link, separate supports for the electrodes, means for driving at least one of the electrode supports relative to the other between a first position for clamping a chain link and a second position for releasing the chain link, including means for automatically detecting the temperature reached in a link during heat treating, said detecting means being positioned to observe a link



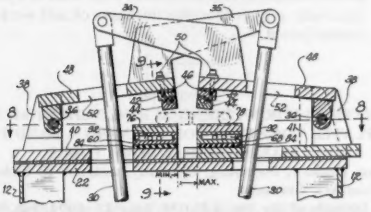
held at approximately the center line between said electrodes when said supports are in said first position, said means for driving the supports including position control means whereby said center line is at the same location each time the supports are moved to the first position, means for controlling the magnitude and duration of the supplying of the electrical power to thereby determine the temperature and time of heat treatment, means operatively connected to said detecting means for releasing the link from between the electrodes when the heat treating time has expired, and quenching means for the link, said quenching means being located for receiving the link after release by the electrodes.

3,909,576

CHAIN LINK AND JOINER HEATER

Earl K. Phares, Hammond, Ind., assignor to S. G. Taylor Chain Company, Inc., Hammond, Ind.

Filed Dec. 17, 1973, Ser. No. 425,333
Int. Cl.[2] B21L *21/00;* **H05B** *3/06*
U.S. Cl. 219—51 **5 Claims**



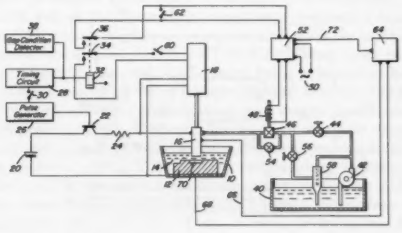
1. An apparatus for heating chain links comprising a pair of spaced apart electrodes, said electrodes each defining a horizontal link supporting surface and being dimensioned to support a single, horizontally disposed chain link spanning the gap between the electrodes, means for supplying electrical power to the electrodes, and clamp means for holding the single chain link in position on the electrodes, said clamp means comprising a pair of separate members each defining a link engaging surface, said separate members being disposed, respectively, above an electrode surface whereby said link lies flat relative to said supporting surfaces and is held in this position by said separate members, each of said clamps being attached to a pivotally mounted support, separate cylinder and piston assemblies, the piston of each assembly being connected to one support, and separate control means for reciprocally moving the respective pistons to thereby release and apply said clamps, a table, the control means for the respective clamps being positioned adjacent the bottom of said table for foot operation of the control means, said table defining a top area for supporting said electrodes and clamps, manually operable means carried on said table for adjusting the relative positions of said electrodes to accommodate links of different sizes, means mounting said piston and cylinder assemblies on said table beneath said top area, and wherein said separate members on said clamp means include pivotally connected link engaging portions associated with said clamps whereby said clamps are adapted to adjust to links of different sizes, said link defining an opening between the link ends and said opening being positioned in the area of the gap between the electrodes whereby substantially all of the heat generated upon application of electrical power is generated in a portion of the link spaced inwardly from said ends.

3,909,577

PULSE CONTROLLED FLUSHING SYSTEM

Leif Houman, Glen Cove, N.Y., assignor to Eltec Pulsitron (Entire), West Caldwell, N.J.

Filed Dec. 11, 1973, Ser. No. 423,725
Int. Cl.[2] B23P *1/08*
U.S. Cl. 219—69 D **2 Claims**



1. Apparatus for machining a workpiece, comprising an electrode spaced from the workpiece to form a gap therebetween, means for supplying current to the electrode to provide intermittent electric discharges across said gap, means for simultaneously retracting said electrode from the workpiece and initiating flushing flow of fluid to flush debris from the gap, timing means for establishing timed retraction periods during which said electrode is retracted and the current to the electrode is interrupted, gap monitoring means for detecting return of the electrode to the workpiece following termination of said timed retraction periods, and means responsive only to said return of the electrode as detected by the gap monitoring means for terminating said flushing flow of fluid which is prolonged belong said retraction periods.

3,909,578

JOINING METAL SHEET OR STRIP

Arthur L. Williams, Warren, and Robert S. Ellis, Canfield, both of Ohio, assignors to Wein United, Inc., Pittsburgh, Pa.

Division of Ser. No. 57,159, July 22, 1970, abandoned. This application Sept. 26, 1973, Ser. No. 400,857
Int. Cl.[2] B23K *11/06*
U.S. Cl. 219—82 **6 Claims**

1. A welding machine for joining adjacent leading and trailing ends of successive elongated strips so that the joined strip may be moved along a line for further processing, said machine comprising a base, a carriage movable along said base in a direction tranversely of the movement of said strip,

said carriage being substantially C-shaped to provide a throat through which said strip passes,

planishing means including a pair of planishing rolls carried in alignment by respective legs of said C-shaped carriage, one of said rolls being movable toward and away from the other to respectively close and open said rolls,

a pair of welding wheels carried in alignment by respective legs of said C-shaped carriage, one of said wheels being movable toward and away from the other to respectively close and open said wheels,

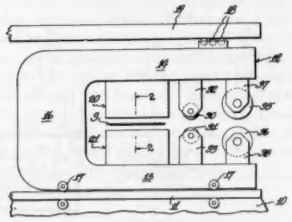
said planishing rolls and said welding wheels being carried by said carriage in spaced relation along the line of movement of the latter,

said welding machine being adapted for use in a continuous, high-speed strip processing line wherein strip from a coil freely passes through said throat until the coil supply is substantially exhausted, the end portion of such strip forming a trailing end, and wherein the leading end of strip from a second coil is fed into said throat and joined to said trailing end, the improvement comprising:

means for interrupting movement of strip from said first coil through said throat when said trailing end approaches the latter, and first clamp means for clamping on said trailing end,

means for feeding the leading end of the strip from said second coil into said throat, and second clamp means for clamping on said leading end,

means for relatively shifting said first and second clamp means to narrowly overlap the adjoining edges of said



trailing and leading ends and thereafter to hold said trailing and leading ends against longitudinal separation until the weld between them has been completed,

said carriage being movable crosswise of said strip from one positiion to a second position, in said one position said planishing rolls and said weld wheels are spaced from one side edge of the overlapped strips with the planishing rolls closer to such edge,

means operable after said trailng and leading ends have been overlapped to move said carriage from said one position crosswise of said strip, said planishing rolls and weld wheels closing and said planishing (wheels) rolls progressively moving longitudinally along said overlap to mash down the same to a condition wherein the overlapped edges are complementarily bevelled,

said weld wheels following said planishing (wheels) rolls and, simultaneously with planishing, progressively welding the planished overlap under pressure to fuse the bevelled edges to each other in a joint not materially greater than the thickness of a single strip thereadjacent,

means to halt crosswise movement of said carriage after said weld wheels have been moved beyond the opposite side edge of the now-welded strips,

means to start free movement of the welded strips and the strip from said second coil through said throat and to further apparatus in said processing line,

and means to open said plane planishing rolls and said weld wheels and to return said carriage to said first position after the last-mentioned strip movement.

3,909,579

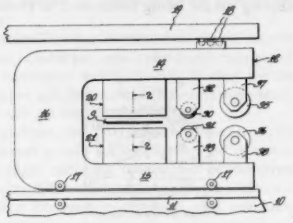
JOINING METAL SHEET OR STRIP

Arthur L. Williams, Warren, and Robert S. Ellis, Canfield, both of Ohio, assignors to Wean United, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 57,159, July 22, 1970, abandoned. This application Sept. 26, 1973, Ser. No. 400,856

Int. Cl.[2] B23K *11/06*

U.S. Cl. 219—83 **3 Claims**



1. The method of welding adjacent leading and trailing ends of successive elongated sheet or strip workpieces of substantially equal end thicknesses comprising the steps of:

longitudinally shifting said workpieces to overlap the trailing end of one workpiece with the leading end of a successive workpiece,

fixedly clamping each said workpiece in position to prevent any relative movement thereof,

moving planishing means crosswise of said workpieces from one side edge to the other and while doing so progressively planishing said overlapped ends in transverse direction with sufficient force to cause the same to be mashed down to a condition wherein the overlapped ends are complementarily bevelled, and

moving welding means with and following said planishing means in the same crosswise movement, while the workpieces are held in initial clamped position without any longitudinal shifting thereof during or subsequent to the planishing step,

and causing said welding means, during said same crosswise movement and simultaneously with said planishing to transversely weld the planished leading and trailing ends under pressure to fuse the ends to each other in a joint not materially greater than the thickness of said workpieces thereadjacent.

3,909,580

METHOD FOR WELDING ALIGNED SHEET METAL PLATES TOGETHER FOR FORMING A BAND FOR MAKING SPIRAL SEAM TUBES

Heinz Krakow, Hamburg, Germany, assignor to Blohm and Voss AG, Germany

Division of Ser. No. 143,035, May 13, 1971, Pat. No. 3,781,509. This application Feb. 20, 1973, Ser. No. 333,794

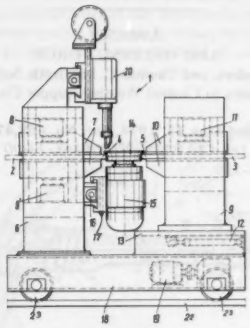
Claims priority, application Germany, June 4, 1970, 2027439

Int. Cl.[2] B23K *9/02, 33/00*

U.S. Cl. 219—105 **6 Claims**

1. Method for producing transverse welds in aligned sheet metal plates to produce a band from which spiral seam tubes are made, comprising the steps of aligning two sheet metal ends with their longitudinal edges, clamping each of said ends separately with their transverse edges spaced from one another securing the plates in a clamped position in a common horizontal plane relative to one another, contemporaneously trimming and chamfering said transverse edges at opposite

sides by a milling head while said plates are in said clamped position, moving said ends by a slidable parallel movement



toward each other to form a welding joint between the same, welding said ends together, and then releasing said clamping.

3,909,581

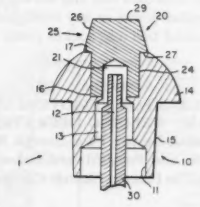
DISPOSABLE RESISTANCE WELDING ELECTRODE

Carl A. Stone; Robert H. Imes; Peter C. Murphy, all of Indianapolis, and Robert D. Thompson, Carmel, all of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation of Ser. No. 251,508, May 8, 1972, which is a continuation of Ser. No. 99,417, Dec. 18, 1970. This application June 25, 1973, Ser. No. 373,167

Int. Cl. B23k *9/24, 35/02*

U.S. Cl. 219—120 **5 Claims**



1. A composite disposable resistance electrode cap comprising a holder member having an enlarged metal containing section, the metal of the metal containing holder member selected from the group consisting of A1, A1 alloys, Fe, Fe alloys, and Zn and Zn alloys, and a metal containing tip having a substantially flat contact face adapted to engage with a workpiece and an external taper gradually reducing in cross sectional dimension toward the contact face, the tip having a portion retained in an aperture of the enlarged section of the holder member to close an end of the aperture and so that the thermal and electrical conductivity are possible between the tip and the enlarged section of the holder member, the metal of the metal containing tip selected from the group consisting of Cu, Cu alloys, W, W alloys, Mo, Mo alloys, Ag alloys, Au alloys and Pt alloys.

3,909,582

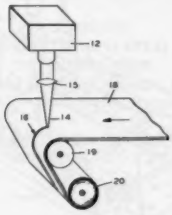
METHOD OF FORMING A LINE OF WEAKNESS IN A MULTILAYER LAMINATE

William Edmund Bowen, Trenton, N.J., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 163,567, July 19, 1971, Pat. No. 3,790,744. This application Jan. 5, 1973, Ser. No. 321,232

Int. Cl. B23k *27/00*

U.S. Cl. 219—121 LM **17 Claims**



1. A method of forming aline of weakness defining a predetermined tear path in a laminate compressing selecting a lamenate having multiple layers one of which is plastic and one or more of which is oriented in a predetermined direction, said line of weakness being formed in at least one but not all of said layers, effecting at a certain rate of speed along said predetermined path, relative movement between said laminate and at least one theretoward source-directed beam of radiant energy, said beam being directed upon the layer most-proximate to said source, said most-proximate layer being a non-metallic material, said energy being selected to have a particular predetermined wavelength and intensity and being coordinated with the thicknesses and energy coefficients of absorption of the respective layers, such that said energy is selectively relatively absorbed by said most-proximate layer in an amount sufficient ot directly preferentially vaporize said most-proximate layer without vaporizing one of the underlying layers not most proximate to said source, in a manner that, aided by the orientation of one or more of the layers, forms said line of weakness in said laminate at a greater processing speed that if said one or more layers was not oriented.

3,909,583

APPARATUS FOR MANUFACTURING EMBRYONIC WIRE COILS HAVING NODULED ENDS

James Petro, and Clair M. Rively, both of Little Falls, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 163,651, July 19, 1971, Pat. No. 3,792,224, which is a division of Ser. No. 792,988, Jan. 22, 1969, abandoned. This application May 30, 1973, Ser. No. 365,368

Int. Cl.² B23K *27/00*

U.S. Cl. 219—121 L **8 Claims**

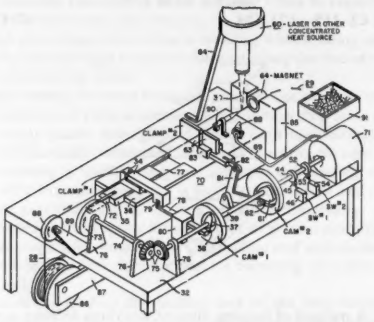
1. Apparatus for manufacturing embryonic mandrel-containing wire coils having noduled ends from a continuous stock wire comprising a metal mandrel and a wire of dissimilar metal that is wound around said mandrel, which apparatus comprises;

means for holding the stock wire and periodically moving it along a predetermined path relative to a controllable source of heat which provides a concentrated heat zone at a location along said path such that the portions of said stock wire are sequentially positioned in the heat zone established by said heat source when the latter is actuated,

means for actuating said heat source for a predetermined period in timed sequence with the operation of said stock wire holding-moving means such that the heat source melts the positioned portion of said stock wire and forms

a molten pool of metal while the stock wire is held stationary relative to said heat zone, and

means for applying a force to the free end of the stock wire (a) in timed sequence with the operation of said holding-moving means and heat source actuating means such that said force is applied immediately after the said positioned



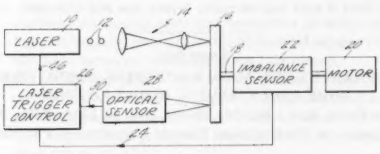
portion of the stock wire is melted and (b) in a direction such that the formed molten pool of metal is divided and separated so that the end segment of the stock wire is thereby severed from the rest of said stock wire and the severed ends of the stock wire are each provided with a nodule of fused metal.

3,909,584

METHOD AND APPARATUS FOR DYNAMICALLY BALANCING A ROTATABLE OBJECT

Michael J. Brienza, Westport, and David C. Smith, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 12, 1974, Ser. No. 478,804
Int. Cl.[2] B23K *27/00*
U.S. Cl. 219—121 LM **7 Claims**



1. In a system for dynamically balancing an object by the selective removal of material from the object through the impingement of pulses of energy on the object, apparatus comprising:

a plurality of removable material concentrations which are supported by the object and located at preselected sites, each concentration being disposed to be separable from the object by an amount of energy which is independent of the amount of energy needed to vaporize said concentration;

drive means for rotating the object about an axis of rotation;

force sensing means for

determining the magnitude and direction of any net imbalance force which is produced in the object during rotation, and

providing an imbalance signal representative of the magnitude and direction of the net imbalance force;

power generation means for providing ouput pulses of energy directed to impinge on the object and cause separation of a removable material concentration from the object; and

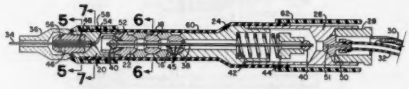
means responsive to the imbalance signal for controlling the location on the object at which the output pulses impinge whereby the pulses are directed to those preselected sites which cause removal of material concentrations until the imbalance force is essentially eliminated.

3,909,585

ARC WELDING TORCH

Harold D. Sanders, and Thomas C. Landreth, both of Houston, Tex., assignors to Central Welding Supply Co., S. Houston, Tex.

Filed May 13, 1974, Ser. No. 469,470
Int. Cl.[2] B23K *9/16;* **F16L** *11/00*
U.S. Cl. 219—130 **16 Claims**



1. In a welding torch comprising in combination:

a body portion having at one end an inlet for the introduction of inert gas;

a head portion attached at one end to the end of said body portion remote said inlet for the introduction of inert gas and having at the opposite end an outlet for the discharge of inert gas, said head portion being in electrical contact with said body portion;

a first conduit through said body portion for passage of inert gas therethrough;

a second conduit in said head portion for the passage of inert gas therethrough, said first conduit being in fluid communication with said second conduit;

means for passing electric current through said body portion and said head portion; and

electrode means in electrical contact with said head portion;

the improvement wherein said body portion includes a plurality of co-axial ball and socket joints and means associated with said plurality of co-axial ball and socket joints comprising a spring tensioned wire passing through and maintaining said ball and socket joints under compressive forces, the spring being axially aligned with said ball and socket joints, to maintain said ball and socket joints in any configuration to which said plurality of co-axial ball and socket joints are deformed.

3,909,586

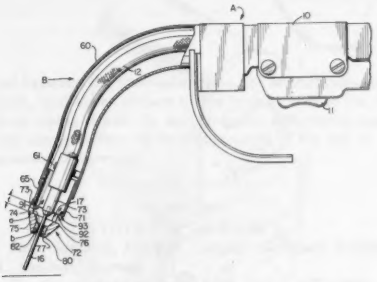
METHOD AND MEANS FOR REMOVING SMOKE FROM OPEN ARC WELDING OPERATIONS

George Gideon Landis, Pepper Pike; Joseph Rudolph Nosse, Richmond Heights, and Ivan Edward Baker, Euclid, all of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed May 8, 1972, Ser. No. 251,223
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—130. **8 Claims**

1. In a welding gun for self-shielded arc welding including an elongated electrode nozzle having a continuous longitudinal passage therethrough and a contact tip through which an arc welding electrode is adapted to be moved axially of the tip toward a workpiece to be welded while an arc is maintained between the end of the electrode and the workpiece, said arc generating heated fumes and smoke, and means including a source of vacuum for removing said fumes and smoke generated at the arc, the improvement comprising: said means including an exhaust tube having a first end communicating with said source and a second end open toward said workpiece, a shield member, means spacing said shield member from said contact tip in the direction toward said workpiece, said shield member having upper and lower surfaces with respect to said direction and an outer surface between said

upper and lower surfaces, said upper surface of said shield member being spaced from said second end of said exhaust tube in said direction to define therewith a radial entrance to said exhaust tube generally transverse to said contact tip, the juncture between said upper and outer surfaces being shaped to facilitate eddy-free flow of fumes and smoke through said entrance, said shield member at said juncture having an outermost edge radially spaced from said contact tip such that the shield member prevents direct impingement of weld spatter on



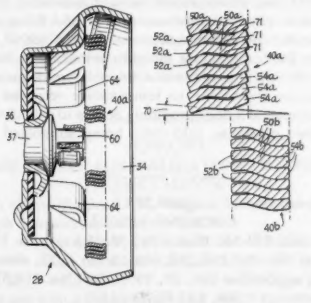
said second end of said exhaust tube, said shield member having an opening therethrough between said upper and lower surfaces, and an insert of electrically insulating material in said opening, said insert having a lower end spaced in said direction from said contact tip and having an electrode receiving aperture therethrough closely spaced radially from said electrode as it moves toward said workpiece, said insert closing said opening through said shield member radially outwardly of said electrode aperture to protect said contact tip from weld spatter and from the heat of the arc.

3,909,587

SPIRAL WOUND ELECTRICAL HEATING ELEMENT

Donald J. Mattis, Norwalk, Conn., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,358
Int. Cl.[2] E23Q *7/22*
U.S. Cl. 219—270 **4 Claims**



1. An electric heating element comprising, in combination:

a. a tight spiral coil of metal heater ribbon,

b. current-carrying members connected respectively to inner and outer end portions of said spiral ribbon, to enable the latter to be electrically energized,

c. the convolutions of said ribbon having a cross-sectional shape in the form of a stretched-out letter Z and having, intermediate their side edges, longitudinally extending central portions which are devoid of sharp edges and contiguous with each other, and which have an insulating oxide coating and make an acute angle with the axis of the coil,

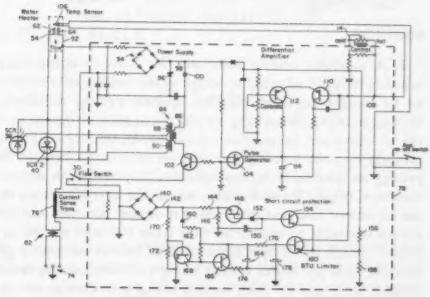
d. side edge portions of the ribbon convolutions which border said central portions at both sides of the coil making a different acute angle with the axis of the coil and being spaced apart not to exceed 0.010 inches, said central and side edge convolution portions being capable of nesting when the convolutions are relatively shifted axially whereby the coil has additional physical support.

3,909,588

TEMPERATURE CONTROL SYSTEM FOR ELECTRIC FLUID HEATER

John A. Walker, and Dimitri S. Dimitri, both of Northridge, Calif., assignors to Datametrics Corporation, Van Nuys, Calif.

Filed Aug. 3, 1973, Ser. No. 385,275
Int. Cl.[2] H05B *3/60, 1/02;* **F24H** *1/10*
U.S. Cl. 219—295 **8 Claims**



1. In combination:

a container defining a chamber for heating conductive liquid contained therein by passing electric current through the liquid, said container having spaced apart electrodes positioned within said chamber for interconnecting said electrodes with a source of electric power,

electronic power control means for interconnecting said electrodes with a source of electric power, said power control means being responsive to application of a predetermined control signal thereto for controlling the electric power applied to said electrodes in accordance with an electrical characteristic of the control signal;

a temperature sensor thermally connected to the liquid in said container,

electronic control circuit means connected to said temperature sensor and said power control means, said control circuit means normally generating the predetermined control signal, said control circuit means being responsive to the temperature sensor for altering the electrical characteristic of the control signal whenever the temperature of the liquid varies from a preset value,

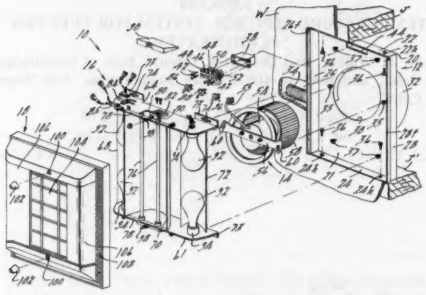
said control circuit means including means for sensing the current flowing through the electrodes and a power limiting circuit responsive to the sensed current for generating a power detection signal whose magnitude represents the power being drawn by said electrodes, said control circuit means being reponsive to said power detection signal exceeding a preset value for altering the control signal to decrease the power applied to said electrodes.

3,909,589

MODULAR HEATING, LIGHTING AND VENTILATING UNIT

Thomas W. Stone, Owosso, Mich., and Stanley D. Benton, Wheaton, Ill., assignors to Ventrola Manufacturing Company, Owosso, Mich. and Sears, Roebuck & Company, Chicago, Ill.

Filed Jan. 11, 1974, Ser. No. 432,499
Int. Cl.[2] H05B 1/00; F24F 7/02; F24H 9/02
U.S. Cl. 219—361 24 Claims



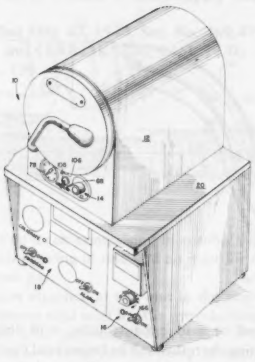
1. A modular ceiling ventilator for a room comprising: a housing module adapted to lodge in the ceiling of a room and to fit snugly between parallel spaced ceiling members; a blower module comprising an electrical blower means operable to move air; means for removably mounting said blower module on said housing module; an accessory module comprising an accessory means operable to provide an accessory function; means for removably mounting said accessory module on one of said first two named modules; air inlet and outlet means operable to enable air flow from the inlet means to the outlet means upon operation of said blower means; a grille module; said air outlet means being provided on the housing module and said air inlet means being provided in the grille module; means removably mounting said grille module on one of said first three named modules; said modules being arranged and constructed such that said ventilator exhausts air from the room when said blower means operates, said accessory module and said blower module being so constructed and positioned relative to each other and the housing module such that air drawn into the housing module through the air inlet means can flow through the blower module to the air outlet means; and wherein said housing module comprises a rectangular housing comprising a rectangular horizontal central wall, and four vertical side walls projecting downwardly from the edges of said horizontal central wall, one pair of diametrically opposite side walls being arranged for juxtaposition with the parallel spaced ceiling members and including openings therein via which the housing may be mounted to the ceiling members, and wherein said horizontal wall includes a centrally located opening therein and said housing module includes an air discharge enclosure above said opening, said air discharge enclosure having provided therein said air outlet means, said blower module being removably mounted on said horizontal central wall with said blower means supported within said enclosure, and wherein said accessory module comprises a central panel means disposed below said opening and a pair of spaced apart side panel means extending upwardly from said central panel means for mounting said accessory module on said central horizontal wall, and means for securing the side panel means to the central horizontal wall, said accessory module and said housing module being arranged and constructed to provide space therebetween via which air can flow around at least a portion of the periphery of said accessory module to enter said opening when said blower means operates.

3,909,590

FURNACE ASSEMBLY FOR FIRING DENTAL PRODUCTS

Robert A. Jensen, Hazel Crest; John A. Tesk, Woodridge, and Daniel Odulio, Chicago, all of Ill., assignors to Howmedica, Inc., New York, N.Y.

Filed Jan. 10, 1975, Ser. No. 540,145
Int. Cl.[2] F27B 5/14; F27D 11/02
U.S. Cl. 219—390 3 Claims



1. An electrically heated furnace for use in firing dental products comprising a housing and a chamber therein which is sealed from exterior ambient conditions, a muffle, means for supporting said muffle within said housing, said muffle including a walled enclosure providing an interior compartment adapted to be heated, electrical resistance means supported by the walls of said enclosure and extending along the length of said compartment, and a door, said door mounted by said enclosure to permit access to said compartment, vacuum generating means, means connecting said vacuum means to said chamber so that the pressure therein may be reduced to a prescribed value, electrical means for programming linearly over a predetermined time period the temperature rise in said muffle compartment to a maximum during a firing cycle, power means, said programming means including circuit means connected to said resistance means, means for controlling input of said power means to said resistance means to provide linear rise in temperature over said firing cycle, a thermocouple, said thermocouple supported within and responsive to the temperature of said compartment, said thermocouple electrically connected to said circuit means, said control means responsive to temperature response to said thermocouple, and a door providing access to said chamber to remove fired products, said door being supported by said enclosure.

3,909,591

COOKING VESSEL

John B. Ulam, 134 Mt. Blaine Dr., McMurray, Pa. 15317

Division of Ser. No. 235,282, March 16, 1972, abandoned.
This application Oct. 29, 1973, Ser. No. 410,578
Int. Cl.[2] F27D 11/02
U.S. Cl. 219—438 12 Claims

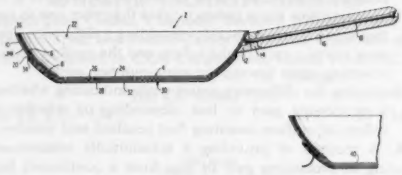
1. A cooking vessel comprising

a metallic cup shaped main body having a bottom wall having upper and lower surfaces, said bottom wall being surrounded by an upstanding peripheral sidewall having interior and exterior surfaces,

a metallic cap having a bottom wall with upper and lower surfaces,

means permanently bonding the periphery of the cap to the main body, and means for forcing said upper surface of

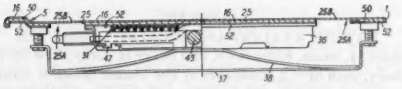
the bottom wall of the cap against said lower surface of the bottom wall of the main body, said means being an hermetically sealed zone at an interface between the main body and the cap, said hermetically sealed zone being at subatmospheric pressure to establish a pressure differential between the atmosphere and the hermetically sealed zone, said lower surface of the bottom wall of the main body being drawn by said pressure differential against said upper surface of the bottom wall of the cap by said pressure differential.



3,909,592
STOVE TOP ASSEMBLY

Svein Eide, Sandved, Norway, assignor to Polaris Fabrikker A.S., Sandnes, Norway

Continuation of Ser. No. 413,430, Nov. 7, 1973, now abandoned. This application Jan. 2, 1975, Ser. No. 538,120
Int. Cl.[2] H05B *3/68*
U.S. Cl. 219—462 **10 Claims**



1. A stove top assembly or the like comprising a thin layer of ductile metallic material, at least one heating unit beneath said ductile layer attached thereto, said heating unit including a first heat distributing layer of metallic material in contact with said layer of ductile material, a second heat distributing layer of metallic material in surrounding and spaced relation to said first layer and being in contact with said layer of ductile material, said layer of ductile material forming a bridge between said first and second layers, said bridge having a hinging action to accommodate thermal expansion, said layer of ductile material having a heat conductivity factor less than 50 K cal/m.h.°C and a thickness of 0.1 mm to 0.8mm, said heating unit including electric heating means for heating said heat distributing layer and heat insulating means beneath said heating unit.

3,909,593
APPARATUS FOR VALIDATING PROCESSED DOCUMENTS

Lorin P. Olson, Tustin, Calif., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

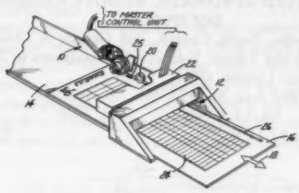
Filed Apr. 1, 1974, Ser. No. 457,070
Int. Cl. G06k *3/00;* **G01d** *15/00*
U.S. Cl. 235—61.9 R **13 Claims**

1. For use with a document reader which transports a document past a read head, an apparatus for marking the document subsequent to reading, said apparatus comprising:

a stationary frame including a document support member defining a support surface,

a lever pivotally mounted to said frame for movement about a first axis and disposed above said support surface, said lever being movable between a raised position and a lowered position,

a circular marking element rotatably carried by said lever for rotation about a second axis, said marking element carrying a transferrable marking substance, and

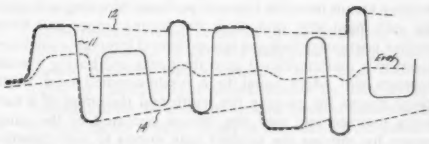


actuator means for effecting movement of said lever to said lowered position to bring said marking element into engagement with a document on said support surface.

3,909,594
CIRCUIT FOR ESTABLISHING A REFERENCE VOLTAGE IN BAR CODE READERS

David C. Allais, Edmonds, and Rudolph P. Host, Seattle, both of Wash., assignors to Interface Mechanisms, Inc., Mountlake Terrace, Wash.

Filed Dec. 26, 1973, Ser. No. 428,039
Int. Cl.[2] G06K *7/10, 11/02, 9/16*
U.S. Cl. 235—61.11 E **14 Claims**



5. A circuit for establishing a reference signal useful in a bar code character reader, said reference signal being established from a reader scan sighal having positive and negative peaks and an instantaneous amplitude which is proportional to the amount of light reflected from the bar code characters scanned by said bar code character reader, the circuit comprising;

first circuit means responsive to said reader scan signal for generating a first signal having a varying amplitude, including means for increasing the amplitude of said first signal proportionally with an increase in the amplitude of said reader scan signal as long as the amplitude of said reader scan signal is more positive than the amplitude of said first signal;

a source of DC voltage;

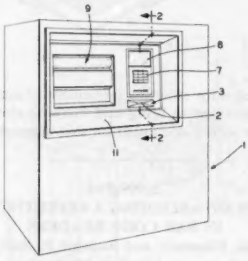
second circuit means responsive to said reader scan signal for generating a second signal having a varying amplitude, said second circuit means including voltage storing means adapted to have a stored voltage therein, said stored voltage comprising said second signal, said second circuit means further including means for charging said voltage storing means from said source of DC voltage as long as the amplitude of said reader scan signal is more positive than the amplitude of said stored voltage, and means for discharging said voltage storing means, such that the amplitude of said stored voltage substantially conforms to the amplitude of said reader scan signal, as long as the amplitude of said reader scan signal is less positive than the amplitude of said stored voltage; and

third circuit means responsive to said first and second signals for establishing a third signal of varying amplitude, including means for maintaining the amplitude of said third signal between the amplitudes of said first and second signals, wherein said third signal comprises said reference signal.

3,909,595
ENTRY GATE CONSTRUCTION FOR CREDIT CARD ACTUATED AUTOMATIC REMOTE BANKING EQUIPMENT

Herbert Morello, North Canton, and George S. Mountford, Chippewa Lake Village, both of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed Aug. 8, 1974, Ser. No. 495,581
Int. Cl. G06k *7/01, 5/00, 7/08*
U.S. Cl. 235—61.11 R **9 Claims**

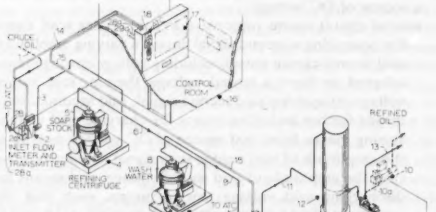


1. Entry gate construction for embossed credit card actuated automatic remote banking equipment including gate housing means forming a longitudinally extending main entry slot open at one end and having the other end adapted normally to be blocked; tumbler gate means mounted on the housing means movable between positions blocking and opening said main slot; said main slot having upper and lower surface portions defining at spaced lateral intervals a thickness equal to a predetermined card thickness and having a width between slot edges equal to a predetermined card width; gauge means for gauging the width and thickness of a card being inserted into said slot; means operated by the gauge means for moving the tumbler gate means to open position upon insertion of a card having said predetermined width and thickness; and longitudinally extending recess and ridge means in said slot upper and lower surfaces preventing passage of an embossed card through the main slot except when presented with a predetermined card surface up and a predetermined card end initially entered into the main slot.

3,909,596
SYSTEM FOR DETERMINING PROCESSING LOSSES OR GAINS

Frank E. Sullivan, 2 Burrell Ct., Tiburon, Calif. 94920

Filed June 18, 1974, Ser. No. 480,402
Int. Cl.² G01F *1/00*
U.S. Cl. 235—92 PD **27 Claims**



1. A method for providing a substantially instantaneous reading of processing gain or loss from a continuous liquid process, comprising:

continuously measuring both the product inflow into said process and the product outflow from said process,

generating pulses corresponding to each of the inflow and outflow measurements,

counting the pulses corresponding to the inflow and the pulses corresponding to the outflow,

when a predetermined set number of pulses has been counted from either inflow or outflow, whichever is first, counting how many pulses it takes the other one to reach that same number, thereby providing a difference count, then starting each of the inflow and the outflow to begin counting again toward the same number, and

displaying the difference count while indicating whether it is processing gain or loss, depending on whether the inflow or outflow counting first reached said number.

8. A method of providing a substantially instantaneous reading of processing gain or loss from a continuous liquid process, comprising:

continuously measuring both the product inflow into said proces and the product outflow from said process,

generating pulses corresponding to each measurement in the order of about one hundred pulses per opund of product flow,

counting said pulses, helping separate the inflow count from the outflow count,

when 10,000 pulses have been counted from either the inflow or the outflow, whichever is first to reach 10,000, determining how many pulses the other one is short of 10,000 to provide a difference count,

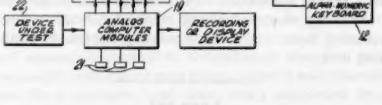
then starting each one eto count again from zero, and

displaying the difference count, except for the eunits digits, as percent gain or loss correct to the nearest tenth of one percent, while indicating whether it is a gain or a loss.

3,909,597
HYBRID ANALOG AND DIGITAL COMPUTER

Robert M. Dunn, Eatontown, and Bruce H. Gray, New Shrewsbury, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 22, 1974, Ser. No. 472,253
Int. Cl.² G06J *1/00*
U.S. Cl. 235—150.5 **14 Claims**



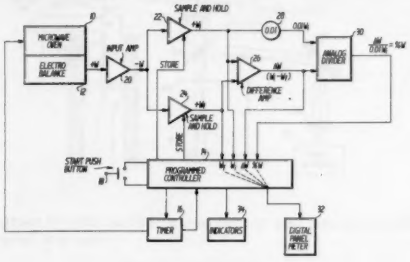
1. A hybrid analog and digital computer system, for use in an iterative closed self-correcting loop between an operator and a hybrid analog and digital computer, including a plurality of analog computer modules, each of said modules having an operational amplifier and an associated impedance network, a switching system connected to each of said modules to connect and disconnect said modules in a variety of configurations, a plurality of analog to digital converters and a plurality of digital to analog converters. both pluralities of converters being connected to said switching system, a programmable digital computer connected to said converters, a graphics terminal including operator responsive means, said graphics terminal being connected to said digital computer, said digital computer being programmed to control the switching of said switching system to configure said analog computer modules in response to operator initiated selection of said operator responsive means, and to provide said operator, via said graphics terminal, with the most recent display of the configu-

ration of said analog computer modules for further on-line reconfiguration by said operator through said operator responsive means.

3,909,598
AUTOMATIC VOLATILITY COMPUTER

Michael John Collins, Charlotte; Bernard William Cruse, Jr., Indian Trail, and Ronald James Goetchius, Charlotte, all of N.C., assignors to CEM Corporation, Indian Trail, N.C.

Filed July 20, 1973, Ser. No. 381,087
Int. Cl.[2] G06G *7/16*
U.S. Cl. 235—151.3 **13 Claims**



1. An automatic volatility computer comprising automatic weighing means, microwave heating means, a program controller means, memory circuit means, differential amplifier means, analog divider means and information readout means, said automatic weighing means being positioned within said microwave heating means, said controlling means being electrically connected to and programmed to sequentially actuate said weighing means and mircrowave heating means, said weighing means being electrially connected to said memory circuit means and hence to said differential amplifier means, said analog divider means being electrically connected to said differential amplifier means and said memory circuit means, the output thereof being electrically connected to said information readout means.

3,909,599
DIGITAL FM DISCRIMINATOR

Wayne B. Trott, Jr., Garland, and Robert F. Brown, Jr., Dallas, both of Tex., assignors to Teledyne Industries, Inc., Dallas, Tex.

Filed Nov. 23, 1973, Ser. No. 418,233
Int. Cl. G01r *23/02*; **G06f** *15/20*
U.S. Cl. 235—151.3 **5 Claims**

1. A discriminator system for converting a frequency modulated (FM) signal whose frequency represents recoverable intelligence into a magnitude representation whose resolution exceeds the resolution obtainable merely by counting cycles of the FM signal over a fixed time interval, comprising:

a. means for receiving said FM signal and delivering data pulses representing its cycles;

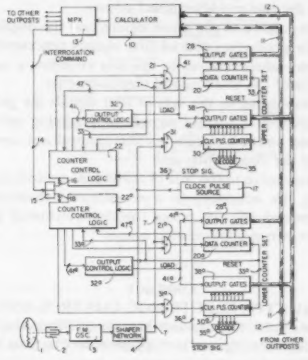
b. a source of clock pulses delivering pulses at higher frequency than said FM signal;

c. data counter means operative when actuated to count said data pulses;

d. clock counter means operative when actuated to count said clock pulses, and having decoder means operative to deliver a STOP signal when the clock counter means has counted a certain number of said clock pulses representing a counting window of fixed duration;

e. control circuitry establishing repeating data acquisition cycles each including one of said windows, the control circuitry being operative upon occurrence of a data pulse at the beginning of a cycle to enable both counter means to commence a counting window, and the control circuitry being operative upon the occurrence of said STOP signal to await the occurrence of the next data pulse and thereupon to terminate the counting of both counter means; and

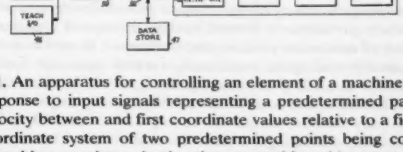
f. calculator means responsive to the number of data pulses counted and to the number of clock pulses counted in the same cycle to calculate said converted representation whose magnitude is proportional to the number of data pulses counted but corrected by a factor relating the number of clock pulses counted within the window and the number of clock pulses incrementally counted between the occurrence of the STOP signal and the subsequent occurrence of the next data pulse, said calculator means including means operative after each counting cycle to calculate said representation by multiplying a constant times the count in the data counter means scaled by said factor which comprises the ratio of the count in the clock pulse counter means upon the occurrence of the STOP signal divided by the latter count plus the clock pulse count incrementally counted between the occurrence of the STOP signal and the subsequent occurrence of said next data pulse.



3,909,600
METHOD AND APPARATUS FOR CONTROLLING AN AUTOMATION ALONG A PREDETERMINED PATH

Richard Edward Hohn, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 265,984, June 26, 1972, abandoned. This application May 31, 1973, Ser. No. 364,381
Int. Cl.[2] B25J *09/00*; **G06F** *15/46*
U.S. Cl. 235—151.11 **27 Claims**



1. An apparatus for controlling an element of a machine in response to input signals representing a predetermined path velocity between and first coordinate values relative to a first coordinate system of two predetermined points being connected by a predetermined path generated by said apparatus,

said machine having a geometric configuration defining a generalized coordinate system independent of said first coordinate system, and said machine having a plurality of actuators with at least one of said actuators defining an axis of rotation affecting the position of the element, the apparatus comprising:

a. means for storing the input signals;

b. means responsive to the input signals representing first coordinate values of and a predetermined path velocity between two of the predetermined points for producing displacement signals, each displacement signal representing an incremental displacement along a predetermined path between the two predetermined points;

c. means responsive to the input signals and the displacement signals for producing sets of first signals representing first coordinate values relative to the first coordinate system of end points of the incremental displacements;

d. means responsive to the sets of first signals for generating sets of individual control signals representing generalized coordinate values relative to the generalized coordinate system of the end points; and

e. means responsive to the sets of individual control signals for operating the actuators in a coordinated manner at the predetermined velocity along the predetermined path between the two predetermined points.

3,909,601

DIGITAL TYPE ELECTRONIC CONTROL SYSTEM

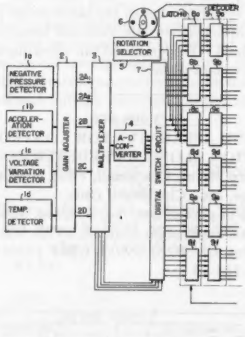
Masao Yamawaki, Handa, and Masakazu Ninomiya, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 20, 1974, Ser. No. 453,159

Claims priority, application Japan, Mar. 21, 1973, 48-32437

Int. Cl.[2] G05B *15/02*

U.S. Cl. 235—151.1 **10 Claims**



1. A digital type electronic control system comprising; a detector for detecting the operational state of a controlled object and generating a detection signal; converter means connected to said detector for converting said detection signal into a digital signal; and controlled variable memory means connected to said converter means for reading out a controlled variable from a main pattern preliminarily set therein according to said digital signal, wherein the improvement comprises; auxiliary memory means provided with an auxiliary pattern preliminarily formed on fine division of a partial region of said main pattern, and connected to said converter mans for reading out a correcting variable from said auxiliary pattern according to said digital signal; and adder means connected to said controlled variable memory means and said auxiliary memory means for adding said controlled variable and said correcting variable to achieve the characteristic control of said controlled object according to said sum.

3,909,602

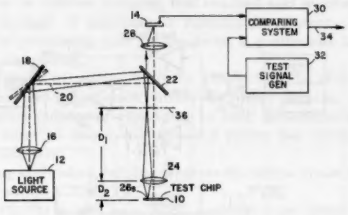
AUTOMATIC VISUAL INSPECTION SYSTEM FOR MICROELECTRONICS

Ernest Z. Micka, LaCanada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Sept. 27, 1973, Ser. No. 401,224

Int. Cl. G06f *15/46;* **G01n** *21/32*

U.S. Cl. 235—151.3 **15 Claims**



1. In apparatus for inspecting a microelectronic circuit by directing a narrow light beam through a scanning device so that the light beam describes a predetermined scanning raster pattern at the microelectronic circuit, and detecting the reflected light, the improvement comprising

means for splitting the light emerging from the scanning device into two light beam components that travel in two different directions;

first and second circuit holding means respectively positioned in the paths of the two beam components, for respectively holding a reference microelectronic circuit device and a test microelectronic circuit device to be inspected;

first and second light detectors;

means for directing light reflected from the surface of each microelectronic circuit device in response to being scanned by said light beam components, onto a different one of the light detectors, each light detector producing output signals representative of the light reflected from elemental areas of said surfaces; and

comparing means connected to the two light detectors for comparing said output signals and producing an output indicative of said comparison.

3,909,603

METHOD OF PROCESSING PRODUCTION WELL LOGGING DATA

Yves Nicolas, Versailles, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Aug. 11, 1971, Ser. No. 170,806

Claims priority, application France, Aug. 12, 1970, 70.29635

Int. Cl.[2] G06F *15/20;* **G06G** *7/57*

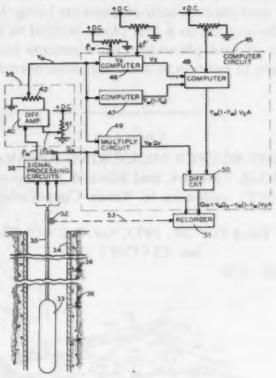
U.S. Cl. 235—151.34 **20 Claims**

1. A method of machine processing well logging data, comprising:

deriving a measurement representative of the proportion of one phase of a multiple phase flow in a well at a selected depth level;

deriving a measurement representative of the total rate of flow of the fluid in a well at said selected depth level; and combining with a machine said derived measurements with a predetermined value of the apparent difference in

density between two phases of said multiple phase flow to produce a representation of the flow rate of at least one



phase of said multiple phase flow at said selected depth level in a well.

3,909,604

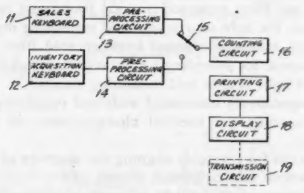
CASH REGISTER

Takashi Monna, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 16, 1974, Ser. No. 533,424

Int. Cl.[2] G06F *3/02*

U.S. Cl. 235—152 **4 Claims**



1. An electronic cash register including processing circuitry for counting, printing and displaying information applied thereto, the improvement comprising business sales keyboard means for producing signals representative of business sales information, inventory keyboard means for selectively producing signals representative of inventory acquisition information, and switching means coupled to said business sales keyboard means and said inventory acquisition means for selectively applying signals produced by one of said keyboard means to said cash register processing circuit.

3,909,605

TOPOGRAPHIC DATA PROCESSING SYSTEMS

Barry Rowe, Workingham, and Harold Frank Rymer, Twyford, both of England, assignors to Ferranti, Limited, Hollinwood, England

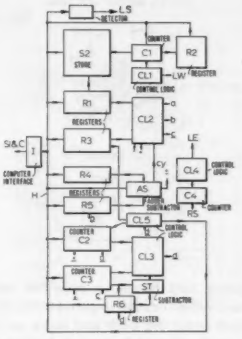
Filed Nov. 9, 1973, Ser. No. 414,343

Claims priority, application United Kingdom, Nov. 21, 1972, 53871/72

Int. Cl.[2] G09B *9/00*

U.S. Cl. 235—152 **7 Claims**

1. A system for processing data relating to topographic features represented by lines on a map, which includes first storage means for storing information representing the coordinates of a plurality of spaced points along the or each required line, second storage means for storing information representing a number of sets of elements each set being defined by one of said spaced points and determining the line between said one point and the next, computer means operably connected to said first storage means and being responsive to signals defining a sight line extending from a selected point on said map in a required direction along which said data is to be



processed in a predetermined manner for determining the set or sets of elements relating to a particular topographic feature in which at least one element may intersect the sight line, and logic means connected to the computer means and to the second storage means and operable to determine the presence and location of the or each such intersection, the logic means including sense means for determining the sense of each intersection between the sight line and an element.

3,909,606

DIGITALLY CONTROLLED-OPERATING SYSTEM

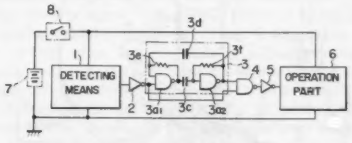
Akira Shibata, Okazaki, and Atutoshi Okamoto, Toyohashi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 6, 1974, Ser. No. 448,645

Claims priority, application Japan, Mar. 7, 1973, 48-27506

Int. Cl.[2] B60T *8/02*

U.S. Cl. 235—153 R **6 Claims**



1. A digitally controlled-operating system comprising:

detecting means for generating detecting pulses with a frequency corresponding to a detected value;

an oscillation circuit connected to said detecting means for generating oscillation pulses with a certain frequency when said frequency of said detecting pulses is lower than a predetermined value and for stopping its oscillating operation when said frequency of the detecting pulses exceeds said predetermined value;

a logical circuit means having input terminals connected to said detecting means and said oscillation circuit and a gate for controlling on-off operation of said gate to produce signals at said gate in accordance with said oscillating pulses; and

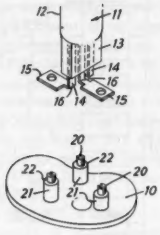
an operation part connected to said logical circuit means for starting its operation upon receipt of said signals.

3,909,607

SEALED-BEAM LAMP CONSTRUCTION

Arthur Samuel Vause, and Frank Woodward, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Oct. 18, 1973, Ser. No. 407,410
Int. Cl.² F21M 3/00
U.S. Cl. 240—41 BM **6 Claims**



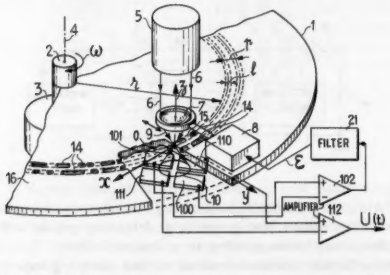
1. In a lighting unit having a reflector and a light bulb mounted on said reflector, the improvement comprising sheet metal legs which enter the bulb and serve as lead-in conductors, the free ends of said legs each having apertures, and coupling means having parts shaped for engaging said apertures and mechanically cooperating to establish the bulb in a predetermined position relative to the reflector, said parts also forming electrical connections between said legs and said coupling means.

3,909,608

REPRODUCING DEVICE FOR THE OPTICAL READING OUT OF A RECORD CARRYING AN EMBOSSED PRINT

Jean Pierre Le Merer; Francois Le Carvennec; Jean Pierre Lacotte; Roland Malissin; Claude Puech, and Claude Tinet, all of paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 18, 1973, Ser. No. 425,793
Claims priority, application France, Dec. 26, 1972, 72.46189
Int. Cl.² G06K 7/10, 11/02; G11B 7/00
U.S. Cl. 250—202 **3 Claims**



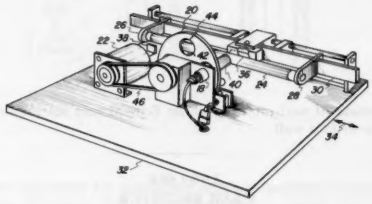
1. A reproducing device for the reading-out of a pulse time modulated waveform stored onto a record in the form of an embossed print having an axis, and carried by an engraved face of said record; said print being of uniform width, and constituted along said axis by a succession of diffractive elements having non-uniform length and spacing at least equal to said width; said reproducing device comprising: illumination means for projecting a concentrated spot of radiant energy onto said embossed print, photoelectric detection means arranged for selectively collecting the diffracted radiant energy emerging from the portion of said embossed print illuminated by said concentrated spot, and moving means arranged for following with said concentrated spot the path of said embossed print; said photoelectric detection means comprising four photodetector elements arranged side by side and supplied symmetrically with said diffracted radiant energy; the two first of said photodetectors elements being disposed symmetrically in relation to a first plane normal to said axis; the two second of said photodetector elements being disposed symmetrically in relation to a second plane normal to said first plane.

3,909,609

LIGHT SOURCE MEASURING APPARATUS

Wayne L. Kidd, Fairport, and Edward J. Majewicz, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1973, Ser. No. 410,834
Int. Cl.² G01J 3/50
U.S. Cl. 250—226 **9 Claims**



1. An apparatus for determining the spectral characteristics of an elongated, substantially tubular apertured light source, including:

a frame;

means for measuring the spectral characteristics of the light source;

at least one filter mounted on said frame and interposed between the light source and said measuring means;

collimator means interposed between said filter and the light source for providing a substantially parallel beam of filtered light rays to said measuring means;

means, operatively associated with said measuring means, for recording the spectral characteristics of the light source;

guide means for rotatably aligning the aperture of the light source with said collimator means; and

means for mounting the light source in a substantially horizontal position with the longitudinal axis thereof substantially normal to the longitudinal axis of said measuring means.

3,909,610

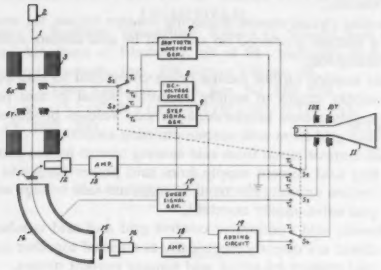
APPARATUS FOR DISPLAYING THE ENERGY DISTRIBUTION OF A CHARGED PARTICLE BEAM

Yasushi Kokubo, Akishima, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Akishima, Japan

Filed Aug. 8, 1974, Ser. No. 495,665
Claims priority, application Japan, Aug. 22, 1973, 48-94170
Int. Cl.² H01J 37/26
U.S. Cl. 250—305 **2 Claims**

2. A display apparatus for displaying the energy distribution of charged particles, said display apparatus incorporating a means for irradiating a specimen with a primary charged particle beam, a deflecting means for varying the irradiating point on the specimen, an analyzer for analyzing the energy of the secondary charged particles emitted from the specimen or the energy loss of the primary charged particles transmitted through the specimen, and a display means in which the display point in the XY plane is determined by the X-axis control means and the Y-axis control means controlled by the output signal of said analyzer, characterized in that a step signal generator output signal controls said deflecting means digi-

tally, said step signal being applied to Y-axis control means of said display means, and the output signal of sweep signal



generator synchronized with said step signal generator controls said analyzer and X-axis control means of said display means.

3,909,611
ADJUSTMENT MECHANISM FOR CHARGED PARTICLE BEAM APPARATUS

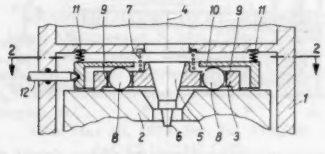
Moriz von Rauch, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 20, 1974, Ser. No. 443,946

Claims priority, application Germany, Feb. 27, 1973, 2310355

Int. Cl.[2] H01J *37/20*

U.S. Cl. 250—306 **2 Claims**



1. A specimen holder adjustment mechanism for a charged particle beam apparatus, comprising:

a support surface disposed within the apparatus perpendicular to the beam axis;

a specimen holder, disposed on said support surface, and moveable transversely with respect to said beam axis, said holder including apertures extending therethrough in a direction parallel to the beam axis;

bearing means, disposed in said holder apertures and engaging said support surface, said bearing means having a dimension which is greater than that of said holder in the direction of said beam axis and less than that of said apertures in the direction perpendicular to said beam axis;

a coupling plate disposed on said bearing means adjacent said specimen holder; and

means, coupled to said plate and operable externally of the apparatus, for adjusting the position of said plate, and thereby said holder, with respect to said axis.

3,909,612
ELECTRON BEAM SPECIMEN ANALYSIS

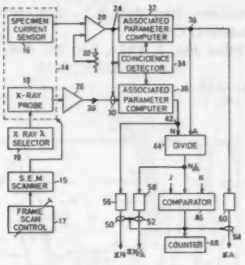
David William Gibbard, Royston, England, assignor to Image Analysing Computers Limited, England

Continuation of Ser. No. 246,075, April 20, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,420

Claims priority, application United Kingdom, Apr. 20, 1971, 10288/71

Int. Cl. G01n *23/04*

U.S. Cl. 250—307 **2 Claims**



1. A method of analysing a specimen comprising the steps of:

scanning the specimen by an electron beam to produce a first electrical signal of the type normally requiring integration over many fields before reliable information is obtained for analysis,

detecting specimen current or voltage variations produced as the electron beam scans across regions in the specimen which have differing electrical properties,

converting detected specimen current or voltage variations into a second electrical signal the amplitude of which varies as different regions of said specimen are scanned, and which represents regions of said specimen having differing electrical properties;

comparing the amplitude excursions of the second signal with a reference signal and detecting any amplitude excursions which exceed the reference signal,

generating signal pulses from the detected excursions, said signal pulses representing borders of said regions of said specimen having differing electrical properties;

gating said first signal by said signal pulses or pulses derived therefrom inhibit the passing of said first signal for analysis except when the amplitude of said second signal is sufficient to exceed said reference signal, so that said first signal is gated for analysis only in regions of said specimen having said differing electrical properties, whereby the need for integrating said first signal over many fields is eliminated;

wherein the first signal is obtained from an X-ray detector probe set to detect any X-ray emission from the specimen due to electron bombardment thereof and said second signal is derived from the variation of the specimen current during scanning,

comparing the instantaneous amplitude of the second signal with a reference voltage,

generating a signal pulse each time the amplitude exceeds the reference voltage,

comparing the instantaneous amplitude of the second signal with a second reference voltage,

inhibiting the generation of a signal pulse if the amplitude exceeds said second reference voltage,

tuning the X-ray probe to preferentially select X-ray radiation of a given wavelength,

counting the pulses from the X-ray probe,

producing an electrical signal equivalent to the total number of pulses,

accumulating the signal pulses,

deriving from the total accumulated signal a measure of the total area of the region or regions of the specimen which produce amplitude excursions of the specimen current signal which exceed the reference voltage; and

dividing the X-ray pulse count signal by the area signal.

3,909,613

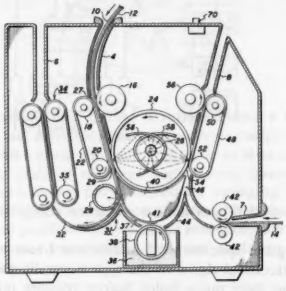
COPYING METHOD AND APPARATUS WITH MEANS TO EFFECT VISIBLE RAY IMAGING AND INFRARED RAY TRANSFIXING OR FUSING

James A. Critchlow, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 2, 1974, Ser. No. 430,279

Int. Cl.² G03C *5/16*

U.S. Cl. 250—319 **10 Claims**



1. A method for using a radiant source which emits substantially more infra-red radiation than visible radiation in thermographically copying an original bearing an image which is principally absorbtive to visible radiation; said method comprising the steps of

bringing said original into engagement with a heat sensitive member to form a sandwich,

exposing said sandwich to radiation from said source to thermally impart said image to said heat sensitive member,

and filtering out a predetermined part of the infra-red radiation emitted from said source while exposing said sandwich, with said filtered out part being selected to prevent excessive heating of infra-red absorbtive areas of said original.

3,909,614

SCOROTRON POWER SUPPLY CIRCUIT

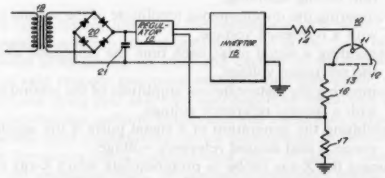
Richard C. Marshall, Harpenden, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 30, 1974, Ser. No. 510,336

Claims priority, application United Kingdom, Dec. 21, 1973, 59538/73

Int. Cl.² G03G *15/00*

U.S. Cl. 250—324 **3 Claims**



1. In electrostatographic copying apparatus including scorotron corona charging apparatus for charging a surface, wherein said scorotron includes a conductive shield a conductive control grid and at least one corona emitting electrode, the improvement in said scorotron charging apparatus comprising:

adjustable electrical power supply means connected to said corona emitting electrode to provide a current supply thereto;

sensing circuit means, including resistor means, for sensing a voltage produced on said grid by said corona emitting electrode,

said sensing circuit means being connected to said power supply means to supply a control signal to said power supply means proportional to said voltage produced on said grid from said corona emitting electrode,

said control signal from said sensing circuit means controlling said current supply from said power supply to said corona emitting electrode to maintain said voltage at said grid substantially constant,

wherein said conductive control grid and said conductive shield are directly electrically connected together and to said resistor means of said sensing current means,

said resistor means conducting the combined total current from said control grid and said conductive shield therethrough,

said combined total current through said resistive means providing said control signal to said power supply means.

3,909,615

APPARATUS FOR MEASURING THE SURFACE DENSITY OF A WEB

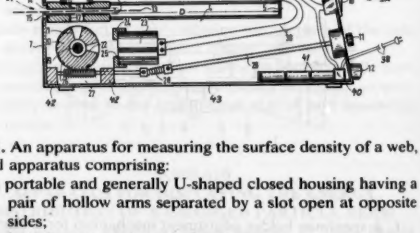
Julius Bosch, Rathsberg, upper Erlangen, Germany, assignor to Frieseke & Hoepfner GmbH, Erlangen, Germany

Filed Feb. 7, 1974, Ser. No. 440,448

Claims priority, application Germany, Feb. 10, 1973, 2306550

Int. Cl. G01n *23/02*

U.S. Cl. 250—358 **10 Claims**



1. An apparatus for measuring the surface density of a web, said apparatus comprising:

a portable and generally U-shaped closed housing having a pair of hollow arms separated by a slot open at opposite sides;

a radiation source in one of said arms;

a first radiation detector in the other arm across said slot from said source;

a second radiation detector in said one arm adjacent said source;

a movable shield in said housing between said source and said detectors and having first and second apertures alignable between said source and said first and second detectors respectively;

an adjustment element on a side of said housing;

means in said housing connecting said adjustment element to said shield for displacing same on actuation of said adjustment element to vary the quantity of radiation from said source falling on said detectors;

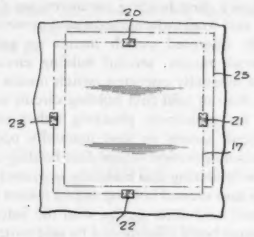
electronic circuit means in said housing connected to said detectors for generating an output corresponding to the relative levels of radiation from said source detected by said detectors; and

indicator means on a side of said housing connected to said circuit means for visually displaying said output.

3,909,616
METHOD AND APPARATUS FOR CHECKING THE SUPERIMPOSITION OF AN X-RAY FIELD AND A LIGHTFIELD

Charles L. Redfield, Woodridge; Robert G. Schultz, and Arne Van Art, both of Elmhurst, all of Ill., assignors to Litton Medical Products, Inc., Elk Grove Village, Ill.

Filed Sept. 16, 1974, Ser. No. 506,258
Int. Cl.² G01N 21/00; G11B 1/00; G21F 5/04
U.S. Cl. 250—491 **9 Claims**



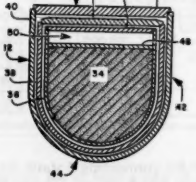
5. In an x-ray system which includes a target area having a film cassette mounted thereon, an x-ray apparatus having a source of x-rays, located a specific distance from said target area, for emitting a beam of x-rays onto said target area, and a collimator having a light emitter for projecting a light beam onto said target area, an apparatus for checking the superimposition of the x-ray field and the lightfield on said target area comprising:

a plurality of target pieces, said target pieces each having a pair of indices equal to the allowable tolerance of the x-ray field position with respect to the lightfield position at the specific source-to-target area distance.

3,909,617
RADIOISOTOPIC HEAT SOURCE

Gary J. Jones, Albuquerque, N. Mex.; James E. Selle, Miamisburg, and Paul E. Teaney, Dayton, both of Ohio, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 30, 1974, Ser. No. 474,548
Int. Cl.² G21H 5/00
U.S. Cl. 250—493 **10 Claims**

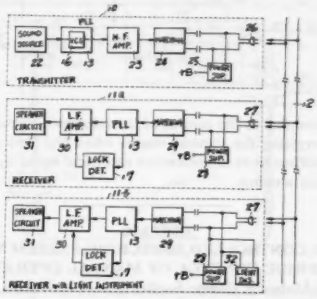


5. A radioisotope heat source comprising an outer sealed container of about 55% Ni, 16% Cr, 16% Mo, 4% W, 5% Fe, 2.5% Co alloy; an inner sealed container of about 90 w/o Ta, 8 w/o Hf alloy nested inside said outer container; and a mixture of from about 96.8 to 92.9 w/o plutonium dioxide shards with a yttrium getter material at least partially filling said inner container, inner walls of said inner container embodying the enhanced characteristics resulting from subjection of said inner container and said mixture to heating to temperature of from about 1570K to about 1720K for a period of about 1 hour.

3,909,618
CARRIER TRANSMISSION SYSTEM UTILIZING COMMERCIAL POWER LINES AS TRANSMISSION LINES

Masaru Fujii, and Tatsuhiro Yasunaga, both of Hiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 18, 1974, Ser. No. 434,832
Claims priority, application Japan, Oct. 23, 1973, 48-119163; Jan. 19, 1973, 48-9643
Int. Cl.² H02J 3/34
U.S. Cl. 307—3 **7 Claims**



1. A frequency modulated carrier transmission system using commercial power lines comprising:

at least a pair of power lines;

a transmitter including a source of sound signals, a first voltage controlled oscillator means having a predetermined free-running center frequency driven by said source of sound signals to provide a frequency modulated carrier signal representative of said sound signals, amplifying and first matching means driven by said frequency modulated carrier signal for coupling the latter to said power lines; and

receiver means including second matching means coupling said receiver means to said power lines to receive said frequency-modulated carrier signal, a phase locked loop circuit including a second voltage controlled oscillator having a substantially identical free-running frequency as said first oscillator and driven by said matching means to provide a demodulated output signal and a lock detection output signal, low frequency amplifier means receiving and amplifying said demodulated output signal in response to the existence of a said lock detection output signal to provide a driver output signal, and sound reproducing means responsive to said driver output signal.

3,909,619
CONTROL FOR ACTIVATING MOTOR VEHICLE ELECTRICAL LOAD

Richard A. Kniesly, Kokomo; Larry L. Colville, and Jerrold L. Mullen, both of Anderson, all of Ind., assignors to Ko An, Inc., Kokomo, Ind.

Filed May 17, 1974, Ser. No. 470,971
Int. Cl.² B60Q 1/02
U.S. Cl. 307—10 LS **13 Claims**

1. A control for coupling electrical power to an electrical load circuit in a motor vehicle having an ignition system comprising:

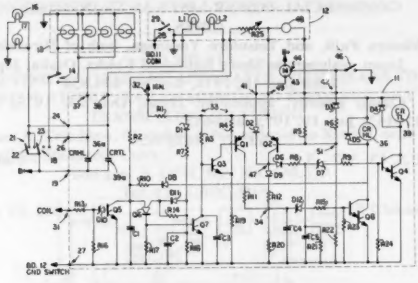
a motor vehicle electrical load circuit;

control means for coupling electrical power to the load circuit when the control means is energized;

ignition circuit means, having an input coupled to ignition pulses in the ignition system of the motor vehicle, for producing at an output a first electrical signal dependent upon the frequency of the ignition pulses;

reference circuit means for producing at an output a reference electrical signal; and

comparison circuit means, having a first input coupled to the output of the ignition circuit means and having a second



input coupled to the output of the reference circuit means, for energizing the control means when the first electrical signal differs from the reference electrical signal by a predetermined amount.

3,909,620

TIME CONTROLLED SWITCHING SYSTEM WITH OVERRIDE CONTROL OF MANUAL OPERATION

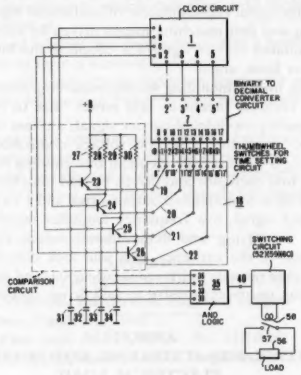
Hirotoshi Matsuda; Osamu Sugita, both of Kawasaki, and Yuji Inoue, Yokohama, all of Japan, assignors to New Nippon Electric Co., Ltd., Osaka, Japan

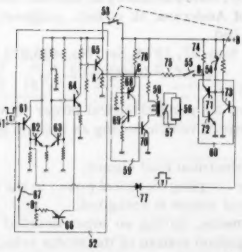
Filed Oct. 29, 1973, Ser. No. 410,524

Claims priority, application Japan, Nov. 4, 1972, 47-110447; Nov. 14, 1972, 47-18038

Int. Cl.[2] H03K *5/13, 17/00*

U.S. Cl. 307—293 **14 Claims**





1. A control system comprising a combination of a timer device and a switching circuit, said timer device comprising clock circuit means for dividing a signal of predetermined time duration into a plurality of signals on the basis of time division and for sequentially producing said plurality of divided time signals at a plurality of output terminals, said plurality of divided time signals corresponding to a time indication, time setting circuit means for setting a desired time, and comparison means for sequentially comparing the time which is set by said time setting circuit means with the time indication represented by said plurality of time divided output signals from said clock circuit means and for producing an output upon the time indication represented by said clock circuit coinciding with the time setting of said time setting circuit means; and said switching circuit means comprising load switch means, manually operated switch means, automatic switching circuit means connected to receive said output of said timer device, first holding circuit means for controlling operation of said load switch means and controlled by either said manually operated switch means or said automatic switching circuit means, second holding circuit means for rendering the manually operated switch means ineffective to control operation of said first holding circuit means, switch-over means for selectively enabling either said automatic switching circuit means or said manually operated switch means to control operation of said first holding circuit means, and means for rendering said manually operated switch means ineffective by said second holding circuit means in response to the output from said timer device with the automatic switching circuit means being conditioned by said switch-over means to control operation of said load switch means whereby said first holding circuit means is controlled by the operation of said automatic switching circuit means and said load switch means is controlled by said first holding circuit means.

3,909,621

METHOD FOR CONNECTING A STATIC INVERTER AND A POWER SOURCE IN PARALLEL TO SUPPLY ELECTRIC ENERGY TO A LOAD AND A LOGIC DEVICE FOR IMPLEMENTING THE METHOD

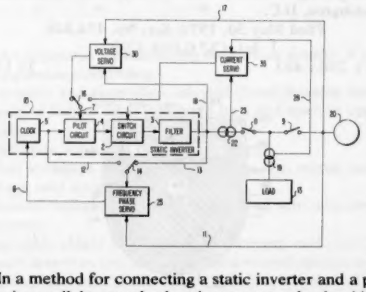
Pierre Nollace, Lamanon; Daniel Soleil; Georges Chabane, both of Salon-de-Provence, and Antoine Bedrossian, Marseille, all of France, assignors to Compagnie Generale d'Electronique Industrielle Lepaute, France

Filed Apr. 9, 1974, Ser. No. 459,406

Claims priority, application France, Apr. 9, 1973, 73.12702

Int. Cl.[2] H02J *7/00*

U.S. Cl. 307—64 **11 Claims**



1. In a method for connecting a static inverter and a power source in parallel to supply electric energy to a load, said static inverter comprising first circuit means for supplying said output signal, pilot circuit means for controlling said first circuit means and a clock circuit, said method comprising the steps of:

A. adjusting the voltage of said output signal in relation to the power source voltage,

B. adjusting the frequency and phase characteristics of said output signal in relation to the power source frequency and phase characteristics,

C. checking coincidence of the instantaneous output voltages of said static inverter and said power source,

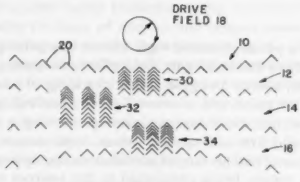
D. thereafter effectively connecting said static inverter and said power source in parallel, and

E. simultaneously replacing step (A) by the step of controlling the current of said output signal in relation to the current absorbed by said load, and modifying step (B) by the step of synchronizing said clock circuit.

3,909,622
MAGNETIC BUBBLE TWO-RAIL LOGIC GATES

Robert C. Minnick, Ouray, Colo., and Robert M. Sandfort, St. Charles, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 22, 1974, Ser. No. 453,784
Int. Cl.² H03K *19/168*
U.S. Cl. 307—88 LC **12 Claims**

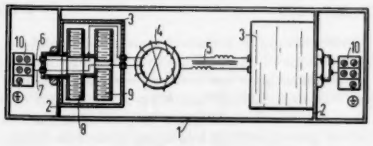


1. A bubble logic gate, comprising means defining first, second, third and fourth bubble channels adjacently arranged in numerical order, and means defining three conditional transfer paths between pairs of said channels respectively for unidirectionally transfering bubbles between said channels in the absence of a predetermined bubble-to-bubble interaction between the channels bridged by each said transfer path, transfer being uniformly in the same direction for each of said three conditional transfer paths, respectively, the transfer path defined between said second and third channels being offset upstream of said other transfer paths.

3,909,623
SUPPLY DEVICE FOR SUPPLY CONDUCTORS OF HIGH FREQUENCY EQUIPMENT AND THE LIKE

Heinz Wagner, Regensburg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 27, 1973, Ser. No. 401,191
Claims priority, application Germany, Oct. 4, 1972, 2248700
Int. Cl.² H01H *3/22*
U.S. Cl. 307—93 **3 Claims**

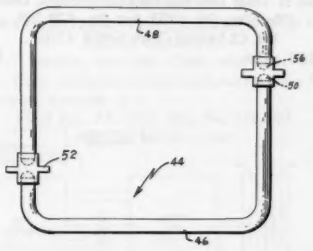


1. A suppressor device for at least a pair of supply conductors of a power supply line for supplying electrical power to electrical and electronic equipment of the type generating high frequencies, as well as being utilizable as a line suppressor for shielded spaces, employing a metal housing which is divided by two partition walls into three successive high frequency shielded chambers containing choke coils, capacitors and connecting terminals, characterized in that one multiple lead through capacitor is provided in each partition wall, with a current-compensated ring-core choke and a second rod-core choke being disposed in the central chamber, each choke being operatively connected to both of such conductors, one of said lead through capacitors, the ring-core choke, the second rod-core choke and the other of the lead through capacitors being connected in series.

3,909,624
SPLIT-RING MARX GENERATOR GRADING

Daniel M. Strickland, Belvedere, S.C., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 7, 1974, Ser. No. 495,472
Int. Cl.² H02M *3/18;* **H01B** *17/44;* **H01T** *17/00*
U.S. Cl. 307—110 **1 Claim**

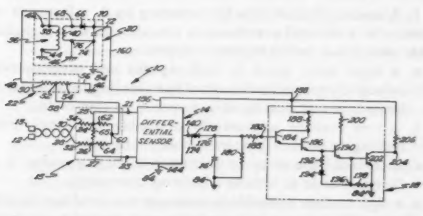


1. A grading ring for distributing transient electrical stress along the longitudinal axis of an ultrahigh voltage electromagnetic pulse generator, including a plurality of capacitors in stacked relationship, power supply means for charging the capacitors, spark gap switching means connecting the capacitors, grading rings encircling each capacitor, charging resistors connected between each grading ring and damping resistors connected between the grading rings and the capacitors comprising: a first tube-like member configurated to conform to the shape of half the cross section of the generator; a second tube-like member formed symmetrical in all dimensions to the first said tube-like member; plug means mounted in each end of the first and second tube-like members, and a cylindrically shaped dielectric spacer means adapted to accept one end of each of said first and second members and having a dielectric baffle centrally positioned to separate said members and extending beyond the diameter of the spacer means.

3,909,625
TOUCH ACTUATED ELECTRONIC SWITCH

David E. Colglazier, Minneapolis, and Willis A. Larson, Wayzata, both of Minn., assignors to Magic Dot, Inc., Minneapolis, Minn.

Filed July 30, 1973, Ser. No. 383,466
Int. Cl.² H03K *13/00*
U.S. Cl. 307—116 **65 Claims**



1. A touch actuated electronic switch, comprising in combination: logic means including first signal input means and second signal input means for receiving signals to be compared and including signal output means for providing an output signal related to the differences in the input signal

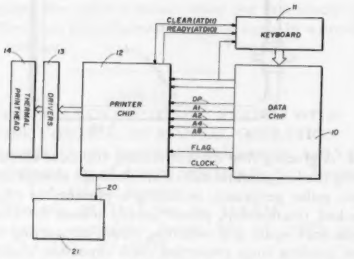
received; at least one touch surface; means for providing an electrical connection between the touch surface and an input means of the logic means; means for receiving an alternating voltage signal; means for providing an electrical connection between the receiving means and the logic means to provide a substantially balanced alternating voltage signal to the first and the second signal input means of the logic means; integrating means; and means for providing an electrical connection between the output means of the logic means and the integrating means.

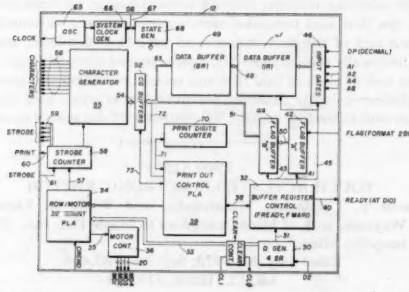
3,909,626

CONTROL OF AXB MATRIX THERMAL PRINTHEAD

K. Balasubramanian, and Joe F. Sexton, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1973, Ser. No. 429,335
Int. Cl.² G06F *7/38*; G06K *15/02*
U.S. Cl. 235—156 **10 Claims**





1. A semiconductor chip for actuating an A × B matrix of heaters in a thermal printhead in accordance with a digital code stored in a buffer register comprising:

a. a logic array gated to said register and programmed selectively to enable A control lines leading to columns of heaters in said printhead in response to said code,

b. a row counter sequentially to enable B control lines leading to rows of heaters in said printhead,

c. a control logic array programmed to be responsive to a function code to initiate a printing operation,

d. a digit counter operable in response to a condition in said control logic array to immobilize said control logic array and to initiate B successive burn cycles each followed by a cool cycle and followed by incrementing said row counter, and

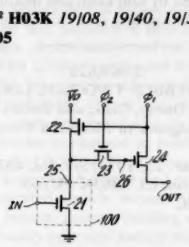
e. means responsive to a condition in said row counter to enable change in said control logic array.

3,909,627

TWO-PHASE DYNAMIC LOGIC CIRCUIT

Masatoshi Mizuno, Tokyo, Japan, assignor to Nippon Electric Company Incorporated, Tokyo, Japan

Filed Nov. 6, 1973, Ser. No. 413,207
Claims priority, application Japan, Nov. 10, 1972, 47-113212
Int. Cl.² H03K *19/08*, *19/40*, *19/34*, *19/36*
U.S. Cl. 307—205 **8 Claims**



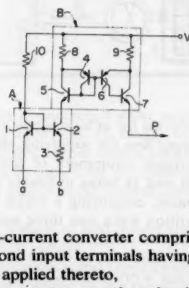
1. A two-phase dynamic logic circuit comprising first, second and third insulated-gate field effect transistors each having a drain, source and gate, a first clock signal source generating a first pulse and a second pulse succeeding said first pulse, a second clock signal source generating a third pulse between said first and second pulses, logic means having an input terminal and an output terminal, said output terminal of said logic means being connected to the sources of said first and second insulated-gate field effect transistors, the drain of said first insulated-gate field effect transistor being connected to one of a D.C. voltage source and said first clock signal source, the gate of said first insulated-gate field effect transistor and the drain of said thrid insulated-gate field effect transistor being connected to said first clock signal source, the gate of said second insulated-gate field effect transistor being connected to said second clock signal source, and the drain of said second insulated-gate field effect transistor being connected to the gate of said third insulated-gate field effect transistor, wherein in response to the input signal supplied to said input terminal of said logic means during the period of time when said third pulse is generated, an output signal is derived from the source of said third insulated-gate field effect transistor during the period of time when said second pulse is generated.

3,909,628

VOLTAGE-TO-CURRENT CONVERTER AND FUNCTION GENERATOR

Katsuya Muto, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed July 12, 1973, Ser. No. 378,609
Claims priority, application Japan, July 18, 1972, 47-72297
Int. Cl.² H03K *17/00*
U.S. Cl. 307—229 **3 Claims**



1. A voltage-to-current converter comprising:

a. first and second input terminals having first and second input signals applied thereto,

b. a voltage-to-current conversion circuit including a first input transistor having its emitter connected to said first

input terminal, a first output transistor having its base connected in common with the base of said first input transistor, and a resistor connected between the emitter of said first output transistor and said second input terminal, said voltage-to-current conversion circuit flowing through said first output transistor a current proportional to the voltage difference between the first and second input terminals, the base and collector of said first input transistor being connected with each other, the collector of said first input transistor being connected to a power supply, said first input and output transistors being of one conductivity type,

c. a current-to-current conversion circuit including a second input transistor and a second output transistor, the collector of said first output transistor of said voltage-to-current conversion circuit being connected with the collector of said second input transistor, the base and collector of said second input transistor being connected with each other, the emitters of said second input and output transistors being connected to said power supply, the base of said second input transistor being connected in common with the base of said second output transistor, said second input and output transistors being of a conductivity type opposite to that of said first input and output transistors, said current-to-current conversion circuit supplying through said second output transistor to an output terminal connected to the collector of said second output transistor a current proportional to the current flowing through said first output transistor.

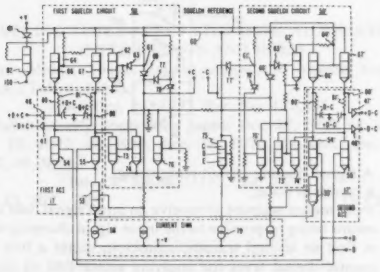
3,909,629
H-CONFIGURED INTEGRATION CIRCUITS WITH PARTICULAR SQUELCH CIRCUIT

Peter T. Marino, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 435,802, Jan. 23, 1974. This application Sept. 30, 1974, Ser. No. 510,322

Int. Cl.[2] G06G 7/12; H03D 13/00; G11B 5/09

U.S. Cl. 307—229 **7 Claims**



1. An integration circuit including in combination:

a capacitor element for containing an integrated signal and having a reference terminal and a signal terminal,

means for supplying an integrating signal to said capacitor element at said signal terminal,

a squelch sink semiconductive element having an electrical connection to said signal terminal and having a control portion,

a squelch source semiconductor element having an output portion electrically connected to said signal terminal, a power receiving terminal and a control portion,

squelch reference means having a given internal impedance and electrically connected to both said control portions of said squelch source and sink semiconductor elements for applying a squelch reference current thereto,

independent semiconductor means electrically respectively connected to said control portions and being normally current conductive at collector current saturation for diverting all of said squelch current from said control portions and exhibiting a saturation time delay in switching from collector current saturation conduction to non-conduction, and

timing control means electrically connected to said integrating signal supply means and to both said independent semiconductor means for actuating said integrating signal supply means and said independent semiconductor means alternately and successively such that at a completion of an integration period said independent semiconductor means delay application of said squelch reference current to said squelch semiconductor elements for permitting sensing any integrated signal in said capacitor element.

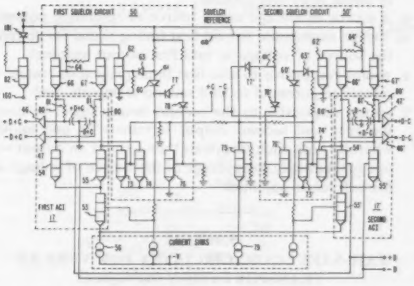
3,909,630
HIGH-RATE INTEGRATION, SQUELCH AND PHASE MEASUREMENTS

Benjamin C. Fiorino, San Jose, Calif., and Peter T. Marino, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 23, 1974, Ser. No. 435,803

Int. Cl.[2] H03K 17/00

U.S. Cl. 307—229 **22 Claims**



1. Signal processing apparatus, including in combination:

first and second electrical signal storage capacitors having a common terminal at a reference potential and each having a signal terminal;

first and second current source transistor elements having commonly connected base electrodes and commonly connected collector electrodes for connection to a power signal source, said first and second current source transistor elements having emitter electrodes respectively ohmically connected to said signal terminals of said first and second signal storage capacitors;

first and second current sink transistor elements having collector electrodes respectively ohmically connected to said first and second signal terminals, commonly ohmically connected emitter electrodes, and electrically independent base electrodes;

means for receiving input signals having a given periodicity to be processed and supplying such received signals to said independent base electrodes;

timing signal generator means responsive to said received signals to generate a timing signal indicative of said given periodicity;

first and second constant current sinks; and

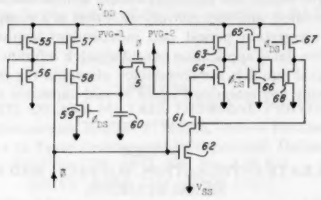
first switching means responsive to said periodicity indication to alternately and successively connect said first and second constant current sinks to said commonly connected emitter electrodes and to said emitter electrodes of said current source transistor elements, respectively.

3,909,631

PRE-CHARGE VOLTAGE GENERATING SYSTEM

Norishisa Kitagawa, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 2, 1973, Ser. No. 385,203
Int. Cl.[2] G11C *11/24, 7/02*
U.S. Cl. 307—238 5 Claims



1. A memory array having a precharge voltage generating system comprising, in combination:

a. first and second precharge voltage output terminals,

b. means for providing first and second periodic timing signals synchronized with timing of access to the memory array, the first and second timing signals being displaced in phase from one another,

c. a source of voltage and a source of reference potential,

d. means responsive to said first timing signal for coupling the source of voltage to said first output terminal,

e. means responsive to said first timing signal to couple the reference potential to said second terminals, and

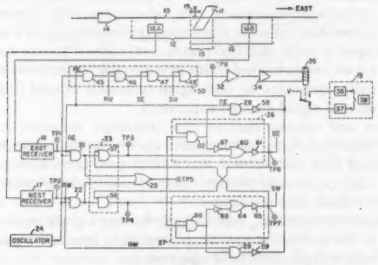
f. means responsive to the second timing signal to couple the first and second output terminals to one another whereby both such terminals then exhibit an output voltage substantially the average of the source of voltage and the reference potential.

3,909,632

FAIL-SAFE LOGIC CIRCUITRY FOR VEHICLE TRANSPORTATION CONTROL

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Division of Ser. No. 282,211, Aug. 21, 1972, abandoned. This application Mar. 20, 1974, Ser. No. 452,897
Int. Cl.[2] H03K *17/02*
U.S. Cl. 307—241 6 Claims



1. A fail-safe control circuit responsive to a first and second input control signal overlapping in duration for selectively producing a most restrictive output signal only for the duration of a first occurring signal of said first and second input control signals, comprising:

a vital signal generator providing means for generating an alternating vital signal,

a first and second input gate means corresponding to said first and second input control signal for gating said alternating vital signal therethrough,

a first and second bistable circuit, each bistable circuit having a first signal input to set said bistable circuits and a second signal input to retain said bistable circuits in a set state, the first of said first and second bistable circuits set by said alternating vital signal gated through the first of said first and second input gate means;

a hold circuit connected to the second signal input of each of said first and second bistable circuits to maintain either one of said first and second bistable circuits in its previously set state when said alternating vital signal is transferred through either said first or second input gate means,

a logic actuation circuit responsive to said first and second input control signals and said first and second bistable circuits to block the transfer of said alternating vital signal through said logic actuation circuit when and only when the first occurring signal of said first and second input control signals is present and its corresponding one of said first and second bistable circuits is set;

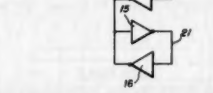
a buffer circuit connected to said actuation circuit, said buffer circuit providing means for producing a least restrictive output signal when and only when said alternating vital signal is transferred to said buffer from said logic actuation circuit.

3,909,633

WIDE BANDWIDTH SOLID STATE INPUT BUFFER

David Wilson Hall, II, Paradise Valley, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 342,667, March 19, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,781
Int. Cl.[2] H03K *5/01, 19/08*
U.S. Cl. 307—268 11 Claims



1. A signal shaping circuit comprising:

a. a common node;

b. input means adapted to receive an input signal, said input means being responsive to the input signal changing states at first or second transition times to either a first or a second digital level for applying either first or second transition voltage signals, respectively, to said first common node;

c. first and second threshold switching device means coupled to said first common node, said first and second threshold switching device means each being responsive to first or second voltage levels, respectively, for changing states;

d. third output threshold switching device means coupled to said first common node and being responsive to a third voltage level for changing states, said third voltage level being intermediate to said first and second voltage levels;

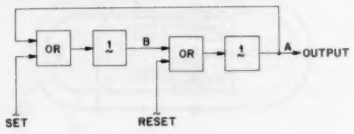
e. said first threshold switching device means being responsive during a first portion of said first transition voltage signal for supplying current in one direction for opposing said first transition voltage signal in going from said first to said second digital level, and being responsive during a second portion of said first transition voltage signal for sinking current in an opposite direction for

assisting said first transition voltage signal in going from said first to said second digital level.

3,909,634
THREE STATE LATCH

Gerald A. Maley, Fishkill, and James L. Walsh, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1971, Ser. No. 113,001
Int. Cl.² H03K *3/29*
U.S. Cl. 307—289 **4 Claims**

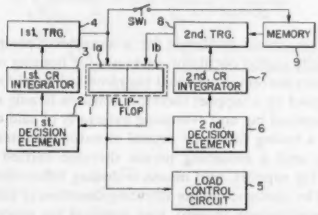


1. A ternary latch circuit comprising
first and second ternary OR gates each having two inputs and one output,
first and second ternary Interchanger 1 gates each having an input and an output,
each of said ternary Interchanger 1 gates operating to interchange their highest and lowest output levels,
means connecting the output of said first and second Interchanger 1 gates to an input of said second and first OR gates, respectively,
means connecting the output of said first and second OR gates to the input of said first and second Interchanger 1 gates, respectively,
means for transmitting a set signal to the other input of said first OR gate, and
means for transmitting a reset signal to the other input of said second OR gate.

3,909,635
CYCLING TIMER APPARATUS WITH AUTOMATIC INTERRUPTION AND HOLD

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 427,656
Claims priority, application Japan, Dec. 28, 1972, 48-3889; Dec. 28, 1972, 48-3890; Dec. 28, 1972, 48-3891; Dec. 28, 1972, 48-3892
Int. Cl.² H03K *5/13, 5/04, 3/281*
U.S. Cl. 307—293 **15 Claims**

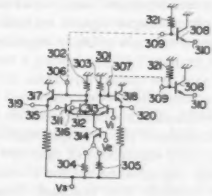


1. A cycling timer with automatic interruption and hold comprising:
bistable means having first and second inputs for setting said bistable means to first and second states, respectively, said bistable means providing at respective output terminals first and second complementary signals in accordance with the state of said bistable means,
first time delay means responsive to said first signal for generating a time-delayed third signal,
second time delay means responsive to said second signal for generating a time-delayed fourth signal,
means for coupling said third and fourth signals to said first and second inputs, respectively, of said bistable means whereby said bistable means is cycled between said first and second states,
load control means connected to said bistable means and having different states responsive to the states of said bistable means, and
hold means connected to said bi-stable means for causing said load control means to maintain a state thereof continuously after a predetermined time interval determined by the operation of said bistable means.

3,909,636
SEMICONDUCTOR LARGE SCALE INTEGRATED CIRCUIT CHIP HAVING CURRENT SWITCHING TYPE LOGICAL CIRCUITS

Akira Masaki, Kodaira, and Yutaka Harada, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 26, 1974, Ser. No. 455,011
Claims priority, application Japan, Mar. 26, 1973, 48-33590
Int. Cl.² H03K *19/08;* **H01L** *27/02*
U.S. Cl. 307—303 **13 Claims**



1. In a semiconductor large scale integrated circuit chip having:
a plurality of current switching logic circuits arranged at an interior portion of said chip, each current switching logic circuit comprising:
a current source, and
at least two current switching transistors, the emitters of which are connected in common to said current source; and
a plurality of emitter follower transistors arranged at a peripheral portion of said chip relative to said interior portion thereof;
the improvement wherein
each of said emitter follower transistors has its base connected to the collector of a current switching transistor located at said interior portion of said chip, and wherein
a first collector load resistor for a current switching transistor located at said interior portion of said chip is connected to the base of each emitter-follower transistor, said first collector load resistor being located adjacent said emitter-follower transistor at the peripheral portion of said chip.

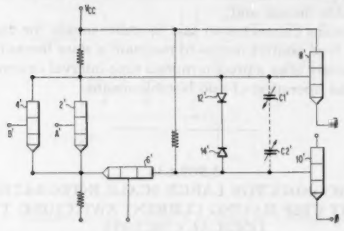
3,909,637
CROSS-COUPLED CAPACITOR FOR AC PERFORMANCE TUNING

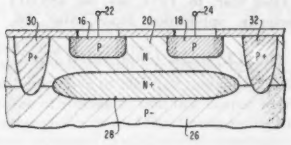
Jack A. Dorler, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 319,596, Dec. 29, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,903

Int. Cl.² H03K *3/26;* **H01L** *29/92*

U.S. Cl. 307—320 **1 Claim**





1. A non-linear integrated circuit comprising at least one current switch having one input and two output terminals and producing opposite phase output signals on said two output terminals in response to a single polarity input signal at said input terminal, a first emitter follower having a base electrode connected to one of said two output terminals, a second emitter follower having its base electrode connected to the other of said two output terminals, capacitance means for delaying the transitions of said opposite phase output signals connected directly between said base electrodes of said first and second emitter followers, said capacitance means consisting of first and second voltage variable P/N junction capacitors connected in series with opposite directions of conductivity, said direct connection between said base electrodes of said series connected first and second voltage variable P/N junction capacitors producing a large dv/dt across said capacitance means due to said output signals being opposite in phase resulting in the effective capacitance seen by each of said output terminals being substantially greater than the capacitances of said first and second voltage variable P/N junction capacitors, and the capacitance of said capacitance means being substantially independent of voltage due to said first and second voltage variable P/N junction capacitors being connected with opposite directions of conductivity.

3,909,638
VARIABLE CERAMIC CAPACITOR FOR AN ELECTRONIC WRISTWATCH

Katsuhiro Teraishi, and Kuniharu Yamada, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

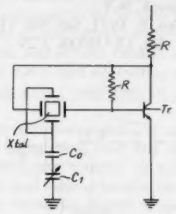
Filed June 5, 1974, Ser. No. 476,642

Claims priority, application Japan, June 5, 1973, 48-63124

Int. Cl.² H01L *41/08*

U.S. Cl. 310—8.1 **9 Claims**

1. A variable ceramic capacitor for adjusting frequency variations in a piezoelectric oscillator of an electronic wristwatch of the type including a piezoelectric oscillator as a standard source therefor and an oscillator circuit operatively connected thereto of the type including compensator means for compensating for frequency variations in said oscillator, said variable ceramic capacitor comprising a ceramic having a permittivity of about 200 to about 1,000 and wherein the effect of temperature on the capacitance thereof is in the range of ± 1,000 ppm/°C for the operative range of said wristwatch, said variable ceramic capacitor being operatively connected in said oscillator circuit for thereby compensating for frequency variations in said oscillator, said ceramic composition comprising a major proportion of $BaTiO_3$ and a minor proportion of carbonates of Group I and Group II elements and oxides of Group IV and Group V elements.



3,909,639
OSCILLATOR FOR A TIMEPIECE

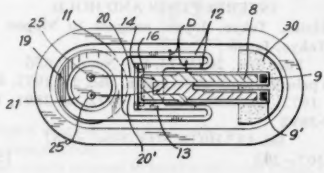
Masanori Kawai, Tatsuno; Haruo Takada, Suwa, and Shinkichi Kobayashi, Chino, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 11, 1974, Ser. No. 460,231

Claims priority, application Japan, June 14, 1973, 48-67132

Int. Cl.² H01L *41/04*

U.S. Cl. 310—9.1 **10 Claims**

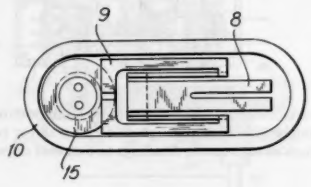


1. An improved oscillator for a timepiece comprising a hermetically sealed oscillator envelope for housing oscillator components therein, a terminal tag mounted in said envelope being carried by a support therefor, contacts fixedly mounted in said terminal tag and extending exteriorly of said envelope housing, a tuning fork-type crystal vibrator mounted in said envelope, and a mounting means therefor carried on said terminal tag support, said means including bifurcations characterized by resilience in the vibrating direction of said crystal and perpendicularly thereto, said terminal tag support comprising a substantially annular support member, an annular rib on the periphery thereof, and a pair of opposed elbows therein, one of said elbows defining a groove having perpendicular abutment surfaces for abutting a continuous edge of an aperture provided in said oscillator envelope and said other elbow defining a groove having perpendicular abutment surfaces for thereby supporting said mounting means, said annular support member having a through hole in which said terminal tag is mounted.

3,909,640
CRYSTAL VIBRATOR MOUNTING

Masanori Kawai, Nagano, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Mar. 26, 1974, Ser. No. 454,888
Claims priority, application Japan, Mar. 27, 1973, 48-34107
Int. Cl.² H01L 41/04
U.S. Cl. 310—9.1 9 Claims

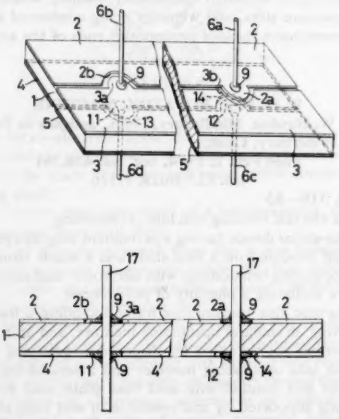


1. An improved oscillator for a timepiece comprising a terminal tag, contacts mounted in said terminal tag, an evacuated envelope hermetically sealed to said tag, a tuning fork type crystal vibrator mounted in said envelope, and a mounting for said crystal comprising a pair of connected elements depending from said terminal tag, each element including a shoulder connected to said terminal tag, an arm connected to said shoulder and forming an elbow therewith, an inwardly arranged finger connected to said arm and forming a second elbow therewith, a downwardly arranged flange depending from said finger, and a cradle member depending laterally between said flanges and connected respectively thereto for supporting said tuning fork type crystal vibrator.

3,909,641
HOLDER DEVICE FOR A VIBRATOR

Yoshimune Ohshima, and Junichi Ishiwata, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Continuation of Ser. No. 230,920, March 1, 1972, abandoned. This application Sept. 4, 1973, Ser. No. 394,521
Int. Cl.² H01L 41/04
U.S. Cl. 310—9.7 3 Claims



1. A piezo-electric vibrator operating in an X-Y flexural vibration mode, said vibrator comprising:

a. a piezo-electric crystal plate having two opposite major surfaces, and edges connecting said surfaces, two of said edges constituting opposite front and rear surfaces;

b. two first electrodes respectively superposed on said major surfaces,

1. each first electrode having a recess intersected by a first nodal axis of vibration of said crystal plate,

2. said axis being perpendicular to said major surfaces and spaced from the edges of said crystal plate;

c. two second electrodes respectively superimposed on said front and rear surfaces,

1. each second electrode having a projection perpendicular to the associated front or rear surface and extending along a respective one of said major surfaces,

2. said projections being received in said recesses respectively,

3. said projections projecting from the associated second electrodes in opposite directions and being intersected by said nodal axis,

4. said crystal plate and said projections being formed with respective passageways aligned along said nodal axis,

5. said crystal plate having a second nodal axis perpendicular to said major surfaces and spaced from said edges and from said first axis, said second axis intersecting said first electrodes, the first electrodes and said crystal plate being formed with respective passageways aligned along said second axis;

d. a first lead passing through the passageways of said crystal plate and of said projections aligned along said first nodal axis and being electrically connected to said intersected projections; and

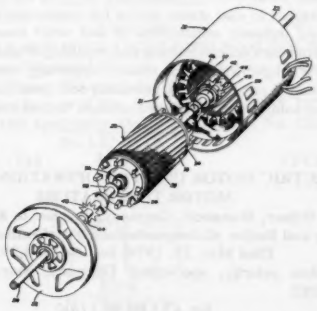
e. a second lead passing through the passageways of said crystal plate and of said first electrodes aligned along said second axis,

1. each of said leads being mechanically fastened to said crystal plate in a passageway of the crystal plate and extending outwardly away from said major surfaces.

3,909,642
DYNAMOELECTRIC MACHINE

Vincent V. Busian, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 211,575, Dec. 23, 1971, Pat. No. 3,786,561, which is a division of Ser. No. 40,224, May 25, 1970, Pat. No. 3,681,836. This application June 28, 1973, Ser. No. 374,409
Int. Cl.² H02K 15/00
U.S. Cl. 310—42 5 Claims



1. A dynamoelectric machine comprising a stationary magnetic structure and a rotatable assembly including a shaft supported for rotation relative to the stationary magnetic structure and a rotatable magnetic structure secured to the shaft, the rotatable assembly further including spacer means

for restricting end play of the rotatable assembly relative to the stationary magnetic structure and for aligning the rotatable and stationary magnetic structures relative to one another, said spacer means comprising at least one spacer in the form of an integral tubular sleeve mounted about the shaft and having an axial length when mounted about the shaft less than its length in its free form, said spacer having a buckled portion when mounted about the shaft with at least one undulation along the buckled portion rigidly securing the spacer as a part of the rotatable assembly.

3,909,643

DIRECT-DRIVEN TYPE PHONOGRAPH TURNTABLE

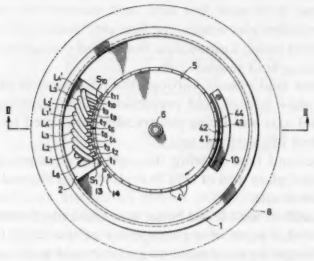
Yukihiro Kishima, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Mar. 25, 1974, Ser. No. 454,553

Claims priority, application Japan, Mar. 24, 1973, 48-35787; Mar. 24, 1973, 48-37788; Feb. 20, 1974, 49-20337; Feb. 20, 1974, 49-20338

Int. Cl.² H02K 1/12

U.S. Cl. 310—68 **6 Claims**



1. A phonograph turntable driving assembly, comprising; a frame;

rotor means having a plurality of equally angularly spaced magnets on a periphery thereof and rotatably supported on said frame for rotating a turntable;

arc-shaped stator means embracing only a portion of said periphery of said rotor means, having a plurality of inwardly extending, equally angularly spaced stator teeth in opposed relation to said magnets, and having electromagnetic coil and circuit means for magnetizing said stator teeth to cyclically attract and repel said magnets and thereby to rotate said rotor means; and

means located in a substantially symmetrical position with respect to said stator means for compensating for static and dynamic unbalances of said rotor means resulting from the cyclic attracting and repelling of said magnets by the magnetized stator teeth, comprising a generally arc-shaped member of magnetically soft material, supported on said frame in opposed relation to said magnets.

3,909,644

ELECTRIC MOTOR UNIT FOR OPERATION AT HIGH MOTOR TEMPERATURE

Fritz Wieser, Wunsiedel, Germany, assignor to Klein, Schanzlin and Becker Aktiengesellschaft, Frankenthal, Germany

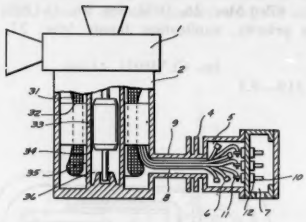
Filed Mar. 25, 1974, Ser. No. 454,293

Claims priority, application Germany, Mar. 27, 1973, 2315192

Int. Cl.² H02K 11/00

U.S. Cl. 310—71 **4 Claims**

1. In an electric motor unit, a combination comprising a motor housing which is at high temperatures during operation thereof; electric motor windings mounted in said housing; a separate connector housing spaced from said motor housing and constructed and arranged to maintain substantially lower temperatures therein, said windings having end portions extending into said connector housing; a terminal box having an



end wall in common with said separate connector housing; and terminals extending through said end wall for connecting end portions of said motor windings to external circuit means.

3,909,645

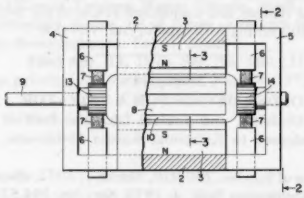
PERMANENT MAGNET MOTOR-TACHOMETER HAVING A SINGLE NON-FERROUS ARMATURE WOUND WITH TWO MUTUALLY-INSULATED WINDINGS EACH CONNECTED TO A SEPARATE COMMUTATOR

John A. Herr, Garwood, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed July 10, 1974, Ser. No. 487,113

Int. Cl.² H02K 23/58

U.S. Cl. 310—138 **5 Claims**



1. A motor-tachometer comprising a permanent-magnet field formed with a single air-gap, a single non-magnetic cylindrical armature mounted for rotation in said air-gap, peripherally-spaced slots formed in said armature, a motor winding and a mutually insulated tachometer winding would in the same armature slots, said windings being connected to separate commutators located on opposite ends of the armature.

3,909,646

ELECTRIC ROTATING MACHINE

Arthur W. Haydon, Middlebury, Conn., assignor to Tri-Tech, Inc., Waterbury, Conn.

Filed Feb. 1, 1974, Ser. No. 438,761

Int. Cl.² H02K 7/116

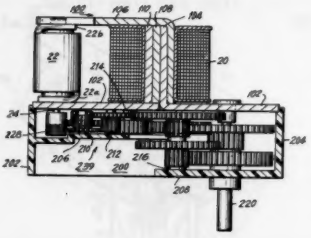
U.S. Cl. 310—83 **3 Claims**

1. An electric rotating machine, comprising:

a rotor-stator device having a permanent magnet cylindrical rotor mounted on a first shaft and a stator structure in cooperating relationship with said rotor, said stator structure including a plurality of pole pieces;

a magnetic flux transmitting frame including a base plate having an integral upstanding member, and an L-shaped member having a first leg disposed in overlying relation with said upstanding member and a second leg spaced from and parallel with said base plate, said first shaft being supported by and rotatable in said base plate and said second leg and said plurality of pole pieces being in magnetic communication with said base plate and said second leg;

a gear assembly housing having side walls and a partitioning wall, said housing and said base plate cooperating to define a compartment; said partitioning wall having a plurality of gear studs formed thereon and extending to said base plate for supporting gears thereon; said gears being disposed within said compartment in intermeshing, speed changing relationship whereby selected ones of said gears exhibit selected angular velocities;



an electromagnetic coil wound about said overlying first leg and said upstanding member for supplying magnetic flux to energize said stator structure to cause said rotor to rotate; and

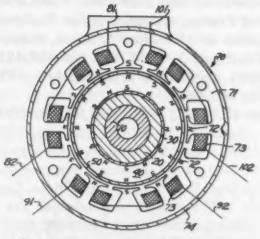
means for transferring the motive force generated by said rotor to said gears.

3,909,647

ROTOR ASSEMBLY FOR PERMANENT MAGNET GENERATOR

A. Duane Peterson, Bainbridge, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed June 22, 1973, Ser. No. 372,718
Int. Cl.² H02K *21/02*
U.S. Cl. 310—156 **11 Claims**



6. In a rotary electrical apparatus having a stator and a rotor with a radial air gap between the adjacent peripheries of the stator and the rotor, the improved rotor which comprises:

a rotor shaft;

a flux carrier ring comprised of a ferromagnetic material telescoped over said shaft;

a layer of material selected from the group consisting of zirconium oxide, magnesium oxide, berylium oxide, titanium oxide, and aluminum oxide, disposed on the outside surface of said flux carrier ring;

a ring-shaped permanent magnet over said flux carrier ring, said magnet being formed of sintered material consisting essentially of cobalt alloyed with at least one rare earth metal, and having a plurality of equally spaced first magnetic poles of alternating polarity at its radially outer surface and a plurality of second magnetic poles at its radially inner surface adjacent said flux carrier ring, said second poles being generally radially aligned with respective first poles and of opposite polarity therefrom;

means for securing flux carrier ring to said rotor shaft; and

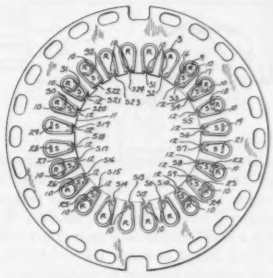
a metallic sleeve embracing the peripheral surface of said magnet in said air gap.

3,909,648

ELECTRIC MOTOR HAVING A WINDING INSULATING BARRIER AND METHOD OF CONSTRUCTION

Norman D. Clark, Dayton, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed July 27, 1973, Ser. No. 383,123
Int. Cl.² H02K *3/46*
U.S. Cl. 310—260 **3 Claims**



1. A stator assembly for a dynamoelectric machine having a plurality of spaced, axially extending slots, a first winding, a second winding, said first and second windings wound in said slots and including a plurality of common slots retaining both said first and second windings, wherein the improvement comprises

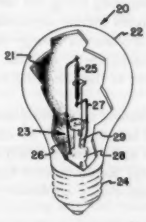
an insulating barrier means disposed between said first and second windings including a plurality of insulating pegs each disposed within said common slots and electrically separating said first and second windings and including oppositely disposed axial projections extending beyond the outer axial ends of said stator assembly, and a plurality of end turn insulating separators each including a pair of transverse sections oppositely disposed at axial ends of said stator assembly and interconnected by a plurality of legs each disposed within one of said common slots with each of said common slots containing a leg disposed adjacent to a peg and electrically separating said first and second windings, said axial projections of said pegs and said transverse sections overlapping and providing complete electrical insulation between said first and second windings.

3,909,649

ELECTRIC LAMP WITH LIGHT-DIFFUSING COATING

Vito J. Arsena, Highland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 348,347, April 5, 1973, abandoned. This application Dec. 20, 1973, Ser. No. 426,494
Int. Cl.² H01K *1/26*
U.S. Cl. 313—116 **13 Claims**



1. A glass electric lamp bulb having on the inside surface thereof a light-diffusing coating of silica particles adhering to

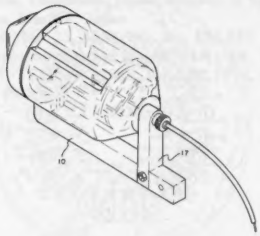
said surface, randomly spaced from one another, and having a diameter within the range from about 0.5 to 1.2 microns, said coating characterized by a density of approximately 0.030 to 0.535 milligrams per square centimeter.

3,909,650

LIGHT GENERATING APPARATUS

Bogdan Comber, 1540 Mt. Ephraim Ave., Camden, N.J. 08104

Filed Mar. 22, 1974, Ser. No. 453,963
Int. Cl.² H01J *1/02*
U.S. Cl. 313—148 **8 Claims**



1. Light generating apparatus comprising:
a first elongate hollow enclosed member formed of a dielectric material and filled with an ionizable gas;
at least one pointed electrode supported within the enclosed member and spaced in close proximity to the inner surface of the hollow member;
a second member formed of a dielectric material of polarity opposite to the first member substantially surrounding the first member and of complementary configuration thereto along the longitudinal axis thereof;
a plurality of elongate slots within the second member parallel to the longitudinal axis thereof; and
means for moving the first and second members relative one to another whereby electrostatic induction generated between the members will ionize the gas within the first member with consequent light emission.

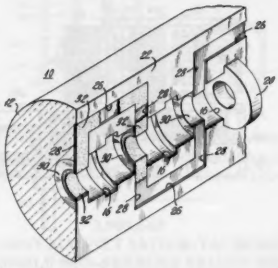
3,909,651

LOW-COST PERIODIC PERMANENT MAGNET AND ELECTROSTATIC FOCUSING SCHEME FOR ELECTRON TUBES

Halsted W. Baker, Forked River, and Arthur H. Gottfried, Rumson, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 15, 1974, Ser. No. 497,787
Int. Cl.² H01J *25/34*
U.S. Cl. 315—3.5 **5 Claims**

1. In a traveling wave tube that has an elongated housing for providing a longitudinal evacuated passageway for an electron beam, a plurality of electron-beam-focusing annular magnets supported within said housing along the length of the passageway, and slow wave circuit means supported along the length of the passageway for transfer of energy between an electron beam traversing the passageway and the slow wave circuit means, the improvement in the traveling wave tube that comprises,
the portion of said housing supporting said magnets and said slow wave circuit means being of non-conductive nonmagnetic material and being formed of two longitudinal parts having planar faces sealed together to form an interface that is essentially coplanar with the axis of the passageway,
said housing being formed along the length of the passageway with axially spaced circular rib-like constrictions and the planar face of at least one of the longitudinal parts of the housing being formed with recesses between every two consecutive constrictions, said recesses being of generally U-configuration, one of the recesses extending from the inner edge of a first constriction normal to the axis for a predetermined distance, then parallel to the axis, and then normal to the axis to the inner edge of the second constriction,



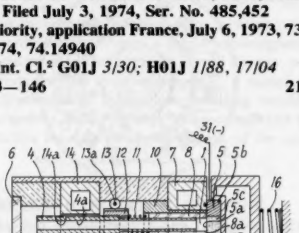
the succeeding recess between the second and third constrictions being substantially the same as but in the direction opposite to the first recess relative to the axis,
successive U-configured recesses alternating on opposite sides of the axis, and
said slow wave circuit means being conductive material filling all said recesses and lining the inwardly directed faces of all said constrictions of both housing parts.

3,909,652

LUMINOUS DISCHARGE CELL FOR SPECTROGRAPHIC ANALYSIS

Salvador Ferre, Massy; Dan Lotan, Paris; Rene Jean Morbioli, Chennevieres; Jean-Claude Alphonse Henri Schmitt, Sainte-Genevieve-des-Bois, and Jean-Louis Cordazzo, Dammarie-les-Lys, all of France, assignors to Ste. Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed July 3, 1974, Ser. No. 485,452
Claims priority, application France, July 6, 1973, 73.24891; Apr. 30, 1974, 74.14940
Int. Cl.² G01J *3/30*; H01J *1/88, 17/04*
U.S. Cl. 313—146 **21 Claims**



1. A luminous discharge cell for spectrographic analysis, comprising a sample-supporting cathode, an anode housing having a window, an anode having at least one light-transmitting through-bore, one end of which is directed towards the cathode, the other end being directed towards the window, and an electrically insulating sleeve interposed between the anode and the housing and surrounding the end of the anode facing the cathode, the sleeve having an annular end and being slidable along the anode, said annular end being arranged, to be applied against a seating surface of the sample supporting cathode, said anode housing and said sample supporting cathode defining a sealed cell chamber, an ionisable gas being enclosed inside said sealed chamber.

3,909,653

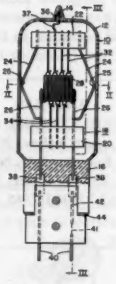
COMPACT ELECTRIC INCANDESCENT LAMP HAVING PLANAR FILAMENT AND IMPROVED MOUNT

Arthur A. Bottone, South Amboy, and Nicholas J. Rainone, Clifton, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 859,531, May 2, 1969, abandoned, which is a continuation of Ser. No. 641,250, May 25, 1967, abandoned. This application May 19, 1972, Ser. No. 255,196

Int. Cl.[2] H01J 1/88, 19/42

U.S. Cl. 313—271 20 Claims



1. In a single-ended electric incandescent lamp adapted for operation at a predetermined wattage, the combination comprising:

a light-transmitting envelope having an hermetic seal at one end and a body portion that contains halogen gas,

a planar filament sealed within said envelope body portion and comprising a plurality of interconnected coiled sections that are fabricated from a refractory material which coacts with said halogen gas when the lamp is energized and establishes a gettering cycle that returns vaporized refractory material to said filament,

said halogen gas being of a type which requires that the inner walls of said envelope attain a predetermined temperature during the operation of the lamp in order to sustain said gettering cycle, and

a mount structure suspending said multi-coil planar filament at a predetermined location within said envelope body portion and comprising (a) a pair of rigid lead-in conductors that are embedded in said hermetic seal and extend into the body portion of said envelope, (b) a transverse bridge member of insulating material that is joined to said pair of lead-in conductors and holds them in spaced apart relationship on opposite sides of said planar filament, and (c) at least one support wire that is anchored in said bridge member and is coupled to a medial part of said planar filament,

each of said lead-in conductors consisting of a wire that extends from the hermetic seal directly to and is fastened to a coiled section of the planar filament that constitutes one end of said filament so that said pair of lead-in conductors, conjoined bridge member, support wire and planar filament comprise an integral assembly,

the ratio of the width of said planar filament to the maximum cross-sectional dimension of the body portion of said envelope being at least 1:3 so that the inner walls of said envelope are thereby heated to the aforesaid temperature required to sustain the gettering cycle when the lamp is operated at said predetermined wattage, and

said lead-in conductors and support wire being composed of a metal which does not chemically react with said halogen gas.

3,909,654

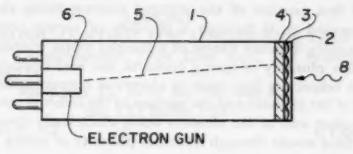
CAMERA TUBE HAVING LENS ELEMENT FOR EACH ELEMENT OF TRI-GLYCERINE SULFATE MOSAIC

Thomas H. Conklin, Ridgefield, Conn.; Merton H. Crowell, Mahopac, and Barry M. Singer, New York, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,712

Int. Cl.[2] H01J 29/89, 39/49

U.S. Cl. 313—388 2 Claims



1. A camera tube comprising an evacuated envelope having a window at one end thereof, means for generating an electron beam within said envelope, a pyroelectric target of tri-glycerine sulfate in proximity to said window for receiving a thermal image and converting said thermal into a potential image which is scanned by said electron beam, said target further comprising a multiplicity of isolated portions of said material to minimize lateral heat flow therein, and means for concentrating said thermal image on the target portions, said latter means comprising a plurality of lens positioned to focus a portion of the thermal image onto each isolated portion of said target.

3,909,655

CATHODE RAY TUBE HAVING CYLINDER WITH INTERNAL RESISTIVE HELIX

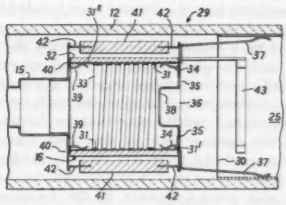
Michael Charles Grimmett, and Douglas Gerald Crawley, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed July 3, 1973, Ser. No. 376,166

Claims priority, application United Kingdom, July 5, 1972, 31514/72

Int. Cl.[2] H01J 29/56, 29/62

U.S. Cl. 313—450 1 Claim



1. A cathode ray tube having an electron gun assembly mounted within a sealed evacuated envelope formed substantially of electrically insulating material and having a first coating of electrically conductive material on part of its external surface and a second coating of electrically conductive material on part of its internal surface, the coatings forming a capacitor which is electrically connected to the final anode of the electron gun assembly by a resistor included in the assembly, a small part of the envelope being formed by an electrically conductive connector, and a clearance being left between the external coating and the connector so that they are electrically insulated from one another, the connector making electrical contact with a first portion of the second coating which portion is in the form of a layer of conducting graphite,

the internal coating having a second portion which is in the form of a layer of aluminium which makes electrical connection with the first portion at a common boundary lying in a plane, the said resistor having a conductive element which provides the resistance of the resistor and is supported by a rigid member formed of electrically insulating material and is in the form of a helix of resistive material, the rigid member being a hollow cylinder, the said helix being coaxial with the cylinder and disposed on the internal surface of the cylinder with a protective layer of chromic oxide overlying the conductive element, that end of the element which is nearer to the said first portion of the internal coating being electrically connected to it through a plurality of spring contacts, an outwardly directed flange of a flanged metal member, and a further plurality of spring contacts, the said contacts having their respective free ends in electrical contact with the said end of the element and the portion of the internal coating, and the other end of the element being electrically connected to the final anode through a further plurality of spring contacts.

3,909,656

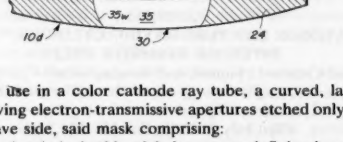
LAYERED, ONE-SIDED ETCHED COLOR SELECTION ELECTRODE

Raymond M. Stachniak, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed May 2, 1974, Ser. No. 466,102

Int. Cl.[2] H01J *29/07;* **B29C** *17/08*

U.S. Cl. 313—402 **4 Claims**



1. For use in a color cathode ray tube, a curved, layered mask having electron-transmissive apertures etched only from its concave side, said mask comprising:

a curved, relatively thin nickel aperture-defining layer susceptible of being etched by a first etchant;

at least one intermediate layer composed of an iron-nickel alloy bonded to the convex surface of the aperture-defining layer and being more easily etched by the first etchant than the aperture-defining layer; and

a relatively thick steel substrate layer bonded to the convex surface of the intermediate layer and susceptible of being etched by a second etchant to which the intermediate layer and the aperture-defining layer are relatively resistant; all layers are etched through, at selected locations, with a pattern of apertures whose walls have a one-sided double-etched profile as would be formed by etching from the concave side of the mask, first through the aperture-defining layer and the intermediate layer with said first etchant and then through the substrate layer with said second etchant at the locations previously etched by said first etchant.

3,909,657

PHOTON CONDITIONING OF GASEOUS DISCHARGE DISPLAY PANEL INCLUDING PHOSPHOR MEANS EMITTING UV RADIATION

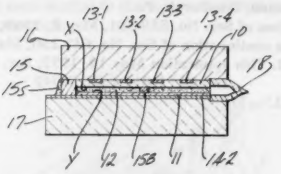
Felix H. Brown, East Lansing, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 5, 1972, Ser. No. 286,016

Int. Cl.[2] H01J *61/35, 61/44*

U.S. Cl. 313—487 **11 Claims**

11. As an article of manufacture, a dielectric body for a gaseous discharge display/memory device, said dielectric body containing at least first and second phosphor means, each said phosphor means being sensitive to and excitable by radiation emitted by a gaseous discharge, said first phosphor means emitting radiation in the near UV non-visible range upon excitation for efficient photon conditioning of a gaseous medium and said second phosphor means emitting light in the visible range upon excitation for viewing of a display and not being excitable by said radiation in the near UV non-visible range emitted by said first phosphor means.



3,909,658

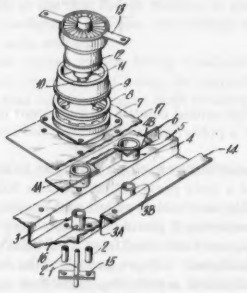
WIDE BAND GRID CIRCUIT COAXIAL TUBE

Elston H. Swanson, Locust Valley, N.Y., assignor to Instruments for Industry, Farmingdale, N.Y.

Filed Apr. 23, 1974, Ser. No. 463,342

Int. Cl.[2] H01J *7/46, 19/80*

U.S. Cl. 315—39 **10 Claims**



1. A coaxial tube assembly comprising:

a chassis;

a substantially rectangular trough electrically connected to said chassis;

a coaxial tube mounted to said chassis having a grid, cathode and anode wherein said cathode is electrically connected to said trough; and

a grid line substantially located within said trough and electrically connected to said grid.

3,909,659

APPARATUS FOR AUTOMATICALLY ADJUSTING THE OPERATION TIME OF AN IRRADIATION DEVICE

Andries van der Meulen, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,106

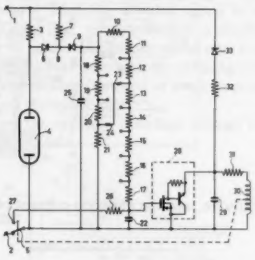
Claims priority, application Netherlands, Jan. 25, 1973, 7301043

Int. Cl. H01j *7/44, 13/46, 17/34*

U.S. Cl. 315—56 **14 Claims**

1. An irradiation device comprising a pair of input terminals, an electric discharge tube whose operating voltage increases after ignition, means connecting the discharge tube in series with a stabilising resistor across said input terminals of the device, means for shunting the stabilising resistor by an auxiliary branch comprising a first diode and a first non-capacitive impedance and having a tap, a timing circuit for automatic termination of the tube irradiation, means connecting a branch of the timing circuit in parallel with the discharge tube through the tap, characterized in that said first diode is

present in the part of the auxiliary branch located between the discharge tube and the tap and the first non-capacitive impedance is present in the part of the auxiliary branch located on the other side of the tap, said branch of the timing circuit including at least a second similar noncapacitive impedance,



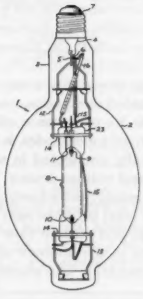
an integrating member of the timing circuit being arranged across at least part of the second impedance for deriving a command signal for termination of the discharge tube irradiation, and means for limiting the direction of current flow through the first impedance of the auxiliary branch to a direction corresponding to the pass direction of the first diode.

3,909,660

METAL HALIDE DISCHARGE LAMP STARTING ELECTRODE

Juris Sulcs, East Cleveland; David L. Jennings, Cleveland, and George R. Garrick, Cleveland Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,638
Int. Cl.[2] H01J *5/50, 61/36, 61/54, 61/56*
U.S. Cl. 315—60 **8 Claims**



1. An electric discharge arc tube for alternating current operation comprising:

a tubular envelope of vitreous material subject to electrolysis and deterioration under electrical stress at high temperatures;

an ionizable radiation-emitting filling within said envelope;

a pair of main thermionic arc-supporting electrodes mounted on inleads including foil portions extending through seals at the generally rounded ends of said envelope;

an auxiliary starting electrode adjacent one of said main electrodes mounted on an inlead including a foil portion extending through the seal generally side-by-side with and in close proximity to that of said adjacent main electrode at one end of said envelope;

a resistance permanently connecting said starting electrode to the opposite main electrode for starting purposes;

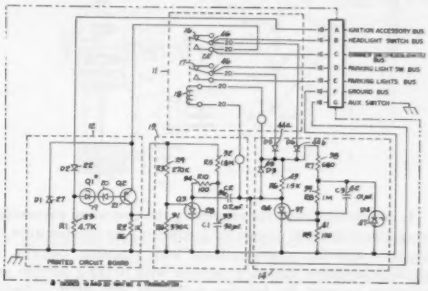
and said starting electrode projecting a short distance only into the envelope and having its tip far enough from that of the adjacent main electrode that substantially no discharge occurs thereto during normal operation, whereby there will be no net potential difference between said starting electrode and the adjacent main electrode and electrolysis in the seal region through which their inleads extend is substantially eliminated.

3,909,661

ELECTRONIC CONTROL FOR AUTOMOBILE LIGHTS

Robert E. Grossenbacher, 1950 22nd Ave., San Francisco, Calif. 94116

Filed July 22, 1974, Ser. No. 490,405
Int. Cl.[2] B60Q *1/04*
U.S. Cl. 315—82 **6 Claims**



1. In a control system for automobile lights including a storage battery having two terminals, one terminal being connected to ground, a plurality of lights, a manual light switch connected between the remaining battery terminal and said lights and an ignition switch connected between said battery and other electrical loads on said battery in said automobile, an electronic control circuit, comprising in combination,

sensing circuitry means electrically connected to said ignition switch and said manual switch, producing a voltage output when said light switch is closed and said ignition switch is open including, a transistor having an emitter electrically connected to said lights, a base, and a collector, a resistor connected between said collector of said transistor and ground, a current switching means electrically connected between said ignition switch and said base of said transistor, for electrically preventing current flow at said base of said transistor when said ignition switch is closed and for electrically allowing current flow to ground at said base of said transistor when said ignition switch is opened, whereby said transistor electrically isolates said resistor when said ignition switch is closed and whereby, when said light switch is closed and said ignition switch is open, said transistor is conductive to provide a voltage potential across said resistor, said voltage potential across said resistor being the voltage output of said sensing circuitry means;

delay circuitry means receiving said voltage output from said sensing circuitry means for providing voltage output after a time delay,

a normally open electrically energized relay switching means connected in series between said manual light switch and said plurality of lights,

driver circuitry means for energizing and closing said normally open relay when said manual light switch is closed and for de-energizing said relay responsive to the voltage output from said delay means to thereby interrupt a circuit between said battery and said plurality of lights when said light switch is closed and said ignition switch is open.

3,909,662

ARRANGEMENT FOR REGULATING THE OPERATING PARAMETERS OF AN ELECTRON BEAM GENERATOR

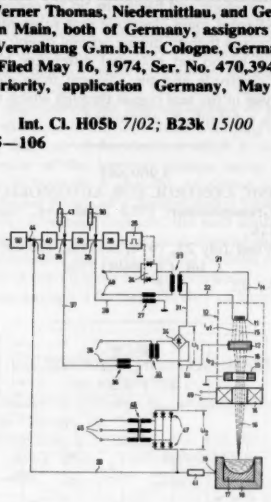
Friedrich Werner Thomas, Niedermittlau, and Gerhard Vock, Hanau am Main, both of Germany, assignors to Leybold-Heraeus-Verwaltung G.m.b.H., Cologne, Germany

Filed May 16, 1974, Ser. No. 470,394

Claims priority, application Germany, May 22, 1973, 2325808

Int. Cl. H05b 7/02; B23k 15/00

U.S. Cl. 315—106 5 Claims



1. An arrangement for regulating the operating parameters of an electron beam generator comprising, in combination, an electron emissive main cathode with emission current, an electron emissive auxiliary cathode with heating current and emission current for heating indirectly said main cathode, means for heating directly said auxiliary cathode, means for generating an accelerating voltage between said main cathode and said auxiliary cathode, regulating means connected to said auxiliary cathode and having three single regulators connected in tandem for regulating the heating current of said auxiliary cathode; feedback means for feeding back to said regulating means a signal corresponding to the emission current of said main cathode, said three signal regulators having applied to their respective inputs, one of three separate signals corresponding to the heating current of said auxiliary cathode, the emission current of said auxiliary cathode, and the emission current of said main cathode.

3,909,663

ARRANGEMENT FOR REGULATING THE OPERATING PARAMETERS OF AN ELECTRON BEAM GENERATOR

Friedrich Werner Thomas, Niedermittlau, and Gerhard Vock, Hanau am Main, both of Germany, assignors to Leybold-Heraeus-Verwaltung G.m.b.H., Cologne, Germany

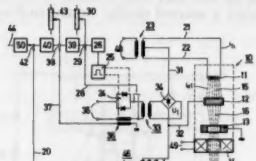
Filed May 16, 1974, Ser. No. 470,395

Claims priority, application Germany, May 22, 1973, 2325786

Int. Cl.[2] H05B 7/02; B23K 15/00

U.S. Cl. 315—106 5 Claims

1. An arrangement for regulating the operating parameters of an electron beam generator comprising, in combination, an electron emissive main cathode with emission current; an electron emissive auxiliary cathode with emission current for heating indirectly said main cathode, means for heating directly said auxiliary cathode; means for generating an accelerating voltage between said main cathode and said auxiliary cathode, voltage regulating means connected to said auxiliary cathode and having three single regulators connected in tandem for regulating the accelerating voltage between said auxiliary cathode and said main cathode; feedback means for feeding back to said regulating means a signal corresponding to the emission current of said main cathode, said three single regulators having applied to their respective inputs, one of three separate signals corresponding to the accelerating voltage of said auxiliary cathode, the emission current of said



auxiliary cathode, and the emission current of said main cathode.

3,909,664

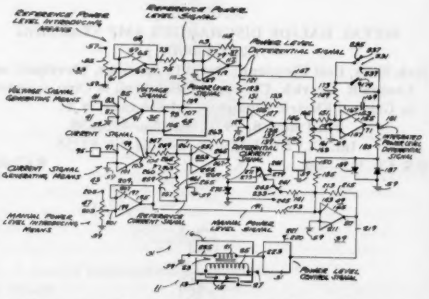
PLASMA SPRAYING METHOD AND APPARATUS

John J. Waskiewicz, Wauwatosa, and John H. Winston, Menomonee Falls, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 17, 1973, Ser. No. 398,158

Int. Cl.[2] H05H 1/26

U.S. Cl. 315—111.2 11 Claims



1. Plasma spraying apparatus comprising a plasma gun including a pair of spaced electrodes connected to a source of voltage and operable to generate a plasma in response to current flow between said electrodes, a transformer having a first winding electrically connected in series between one of said electrodes and said voltage source, said transformer also including a second winding, and a control circuit for maintaining a uniform power level between said electrodes regardless of variance in voltage and current flow which can occur between said electrodes in the absence of said control circuit, said control circuit including said second winding.

3,909,665

DRIVING SYSTEM FOR A GAS DISCHARGE PANEL

Shizuo Andoh; Toshinori Urade, both of Kobe; Tadatsugu Hirose, and Yasunari Shirouchi, both of Akashi, all of Japan, assignors to Fujitsu Ltd., Japan

Filed Mar. 23, 1973, Ser. No. 344,095

Claims priority, application Japan, Mar. 24, 1972, 47-29628

Int. Cl.[2] H05B 37/00

U.S. Cl. 315—169 TV 12 Claims

1. An energizing system for a gas discharge display including a first base plate and a first set of electrodes disposed thereon with a dielectric layer disposed over said first set of electrodes, and a second base plate and a second set of electrodes disposed thereon in opposite relationship to said first set of electrodes and defining a region for confining a dis-

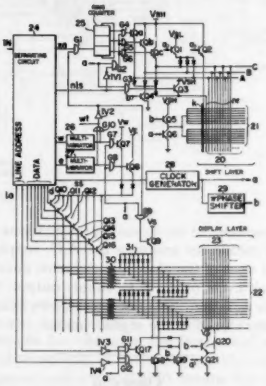
charge gas therebetween, said energizing system comprising:

a. priming means for applying a discharge voltage to a selected one of successive electrode pairs of said second set to establish a priming fire therebetween;

b. shift means for sequentially applying a shift voltage to remaining successive such pairs of electrodes of said second set thereby to shift said priming fire thereto;

c. write means for applying a write signal to a selected electrode of said first set to establish a discharge at an intersection of said selected electrode and an electrode pair of said second set on which the priming fire is shifted whereby a wall charge is stored at a corresponding position upon said dielectric layer;

d. sustain means for applying a sustain voltage to said first set of electrodes; and



e. erase means having an address means for identifying a position defined by said first set of electrodes to be erased and for causing said shift means to shift a priming fire to an electrode pair of said second set corresponding to the said address identified position of the first set of electrodes, said erase means further including means operating in conjunction with said address means for terminating the application of the sustain voltage by said sustain means to said first set of electrodes for a predetermined period whereby the shifted priming fire neutralizes the wall charge stored upon said dielectric layer at said address identified position thereof, corresponding to the shifted position of the priming fire.

3,909,666

BALLAST CIRCUIT FOR GASEOUS DISCHARGE LAMPS

Stanley N. Tenen, P.O. Box 164, Milford, N.H. 03055

Filed Dec. 26, 1973, Ser. No. 428,025

Int. Cl.² H05B *37/00*

U.S. Cl. 315—200 R **6 Claims**

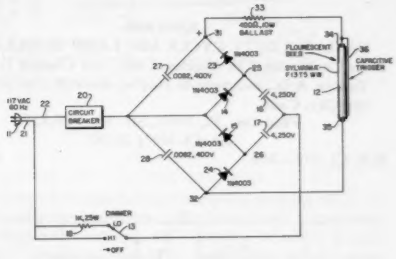
1. A gas discharge lamp starting and ballast circuit comprising,

an input terminal pair for receiving a-c energy,

first voltage doubler circuit means coupled to said input terminal pair for substantially doubling the peak voltage between said input terminal pair and comprising first and second unilaterally conductive devices connected in series and poled in the same sense shunted by first and second capacitors connected in series to form a bridge circuit having four junctions with the junction between said first and second unilaterally conductive devices coupled to one terminal of said input terminal pair and the junction between said first and second capacitors coupled to the other terminal of said input terminal pair,

second voltage doubler circuit means for selectively substantially doubling the voltage provided by said first voltage doubler circuit means and comprising third and fourth unilaterally conducting devices separated by, connected in series with and poled in the same sense as said first and second unilaterally conducting devices and third and fourth capacitors connected in series across the series combination of said first, second, third and fourth unilaterally conducting devices with the junction of said third and fourth capacitors coupled to the junction between said first and second unilaterally conducting devices,

the impedance of said first and second capacitors being much lower than the impedance of said third and fourth capacitors whereby the current flowing through said first and second capacitors when a gas discharge lamp is connected in series between the junction of said third capacitor with said third unilaterally conducting device and the junction between said fourth capacitor with said fourth



unilaterally conducting device is so much greater than the current then flowing through said third and fourth capacitors that the voltage increasing effect of said third and fourth capacitors is then negligible,

whereby said first voltage doubler circuit means, said second voltage doubler circuit means and said gas discharge lamp may comprise means for initially establishing both said voltage doubler circuit means operative for providing an output voltage more than twice the peak voltage between said first and second voltage doulber circuit means from said input terminal pair and thereafter rendering only said first voltage doubler circuit means operative for providing at the output of said first and second voltage doubler circuit means a voltage substantially twice that between said input terminal pair.

3,909,667

ELECTRONIC FLASH APPARATUS

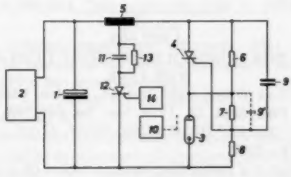
Hans-Heino Decker, Vechelde, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Jan. 29, 1974, Ser. No. 437,672

Claims priority, application Germany, Feb. 7, 1973, 2305782

Int. Cl.² H05B *41/32, 41/36*

U.S. Cl. 315—241 P **4 Claims**



1. Electronic flash apparatus for photographic purposes, comprising a flash tube, a thyristor in series with said tube for

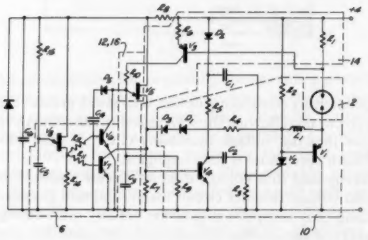
controlling flow of current through said tube, means for igniting said tube, there being a voltage drop occurring in a discharge section of said flash tube when it is ignited, and means responsive to said voltage drop for causing said thyristor to become conductive so that discharge current may flow through said tube and through said thyristor to create a light flash in said tube, said means for causing said thyristor to become conductive comprising means for supplying said thyristor with a control grid potential which is less than the initial potential applied to the cathode of said thyristor immediately before the ignition of said flash tube, and means effective immediately upon ignition of the flash tube for reducing the cathode potential of said thyristor to a potential sufficiently lower than said control grid potential so that said thyristor becomes conductive.

3,909,668

VARIABLE DUTY CYCLE ARC LAMP MODULATOR

Peter Laakmann, Los Angeles, Calif., and Charles U. Boutin, Tucson, Ariz., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 22, 1966, Ser. No. 605,139
Int. Cl. H01j *29/00*
U.S. Cl. 315—209 **4 Claims**



1. Apparatus for controlling the supply of power from a power source to an arc lamp comprising:
an arc lamp;
a power supply connected to said arc lamp;
a bistable switch connected in series with the lamp and the power supply having an ON state in which the power supply is electrically connected to the arc lamp and an OFF state in which the power supply is not electrically connected to the arc lamp;
first means to supply first electrical pulses to the switch at regular intervals to trigger the switch into the ON state; and
second means to supply second electrical pulses to the switch to trigger the switch into the OFF state, said second means comprising a current integrator for sensing current flow through the arc lamp and pulse generating means for generating the second pulses when a predetermined value of the time integral of the sensed current is provided by the integrator.

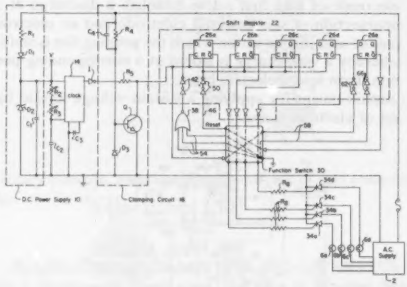
3,909,669

CIRCUIT FOR CONTROLLING LIGHT DISPLAYS AND THE LIKE

Laurence Clark White, 1357 28th St., Ogden, Utah 84403

Filed Sept. 25, 1974, Ser. No. 508,988
Int. Cl.[2] H05B *37/00, 39/00, 41/16*
U.S. Cl. 315—250 **15 Claims**

1. A circuit for controlling the activation of a plurality of electrical elements by an A.C. supply comprising
clock means for generating a sequence of clock pulses,
register means for storing signal representation and for altering the stored representations in response to said clock pulses,
a clamping circuit coupled between the clock means and register means and responsive to the A.C. supply output for preventing application of clock pulses to the register means during every other half cycle of the A.C. supply output, and



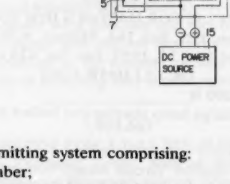
means responsive to the signal representations stored in the register means for enabling the A.C. supply to activate selected ones of the electrical elements during said every other half cycle of the A.C. supply output, the electrical elements activated being determined by the signal representations stored in the register means.

3,909,670

LIGHT EMITTING SYSTEM

Hisato Wakamatsu, Toyota; Matatoyo Hinachi, Nagoya, and Masao Kotera, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed June 25, 1974, Ser. No. 482,989
Claims priority, application Japan, June 27, 1973, 48-72527
Int. Cl. B60q *3/04;* **H05b** *33/02*
U.S. Cl. 315—276 **7 Claims**

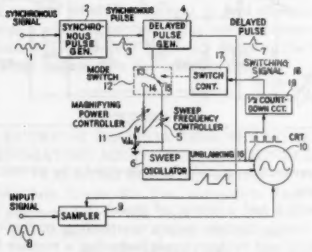


1. A light emitting system comprising:
a fixed member;
an oscillator mounted on said fixed member oscillating at a high frequency;
a fixed coil mounted on said fixed member and connected electrically to the output terminals of said oscillator, said fixed coil being energized by the output thereof;
a power source mounted on said fixed member and connected to said oscillator to supply power thereto;
a moving member movable relative to said fixed coil;
a movable coil mounted on said moving member and electromagnetically coupled with said fixed coil; and
a light emitting element mounted on said moving member and connected to said movable coil to generate light by an excitation current from said movable coil.

3,909,671
SAMPLING OSCILLOSCOPE HAVING MEANS FOR MAGNIFYING A PART OF AN OBSERVED WAVE FORM ALONG THE TIME BASE

Naohisa Nakaya, 3463 Izumi, Komae, Tokyo, Japan

Continuation-in-part of Ser. No. 165,613, July 23, 1971, abandoned. This application Nov. 16, 1973, Ser. No. 416,652
Claims priority, application Japan, July 23, 1970, 45-63902
Int. Cl.² H01J 29/70
U.S. Cl. 315—395 10 Claims



1. A sampling oscilloscope, comprising:

a cathode-ray tube display assembly having horizontal sweep means for changing the horizontal position of a displayed waveform in response to external signals applied thereto and vertical shift means for changing the vertical position of a displayed waveform in response to external signals applied thereto;

a sweep oscillator connected to said horizontal sweep means of the cathode-ray tube display assembly for generating a sweep voltage signal;

synchronous means for generating synchronous pulses having a controllable constant period;

variable attenuation means connected to the output of the sweep oscillator for attenuating the sweep voltage, said variable attenuation means comprising means responsive to control signals for controlling the attenuation of said variable attenuation means in response to said control signals;

a delayed pulse generator connected to the output of said variable attenuation means and said synchronous means and including means for generating a high-speed saw-tooth wave in synchronism with said synchronous pulses and means for comparing respective instantaneous levels of said high-speed saw-tooth wave with the output of the variable attenuation means and for generating a pulse each time the compared instantaneous levels of the high-speed saw-tooth wave and the output of said variable attenuation means are equal;

input means for receiving an input signal;

first sampling means connected to said input means and said delay pulse generator for sampling the input signal in response to the pulses developed by said delay pulse generator to produce a first converted signal, which has a frequency lower than the frequency of the input signal and a waveform similar to the waveform of the input signal;

means for applying said first converted signal to said vertical shift means of the cathode-ray tube display assembly;

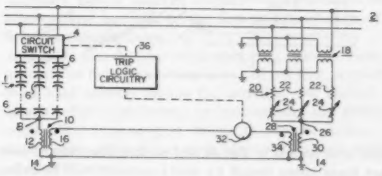
switch signal means for generating a switching signal;

and switch control means connected to said means responsive to control signals and said switch signal means for automatically varying the attenuation of said variable attenuation means in response to said switching signal.

3,909,672
CAPACITOR BANK PROTECTION RELAY

Thomas G. Lundquist, Salt Lake, Utah, and Victor Burtnyk, Winnepeg, Canada, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 7, 1974, Ser. No. 440,606
Int. Cl.² H02H 7/16
U.S. Cl. 317—12 B 9 Claims



1. A protective relay for protecting a polyphase shunt capacitor bank energized from a polyphase power transmission line in which said bank includes a plurality of arrays of interconnected capacitors, said relay comprising, a first circuit means operatively connected to said polyphase capacitor bank and sensing the magnitude of the current through each of said capacitor arrays established as a consequence of the operation of said capacitor bank, said first means having an output circuit energized with a first output quantity having a magnitude which is a function of the change in relative operating condition of said capacitor arrays, a second circuit means consisting solely of substantially resistive elements operatively connected to said polyphase line and sensing the magnitude of a desired electrical component established as a consequence of the opertion of said transmission line, the magnitude of said second output quantity being a function of the magnitude of the voltage relations between the conductors said polyphase line, and third circuit means operatively connected to said output circuits of said first and second circuit means, said third circuit means having an output circuit energized in response to a change in the relative in magnitudes of said first and second output quantities.

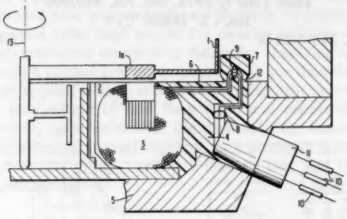
3,909,673
INSTALLATION FOR STOPPING DRIVE MOTOR OF ROTATING MACHINE IN EVENT OF DESTRUCTION OF A ROTATING MACHINE PART

Ottmar Kreissl, Dachau, and Eckhard Pritsch, Haaren, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG and URANIT Uran-Isotopentrennungs-GmbH, Germany

Continuation-in-part of Ser. No. 238,339, March 27, 1972, Pat. No. 3,798,504. This application Feb. 1, 1974, Ser. No. 438,628
Claims priority, application Germany, Mar. 25, 1971, 2114406The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.
Int. Cl.² H02H 7/08
U.S. Cl. 317—13 R 2 Claims

1. In a device for automatically stopping a drive motor of a rotating member in the event of rotational destruction of the rotating member, said device being of the type having a pin-like boss means disposed adjacent to a rotating portion of said member in such a manner to be struck by fragments of said rotating member in the event of destruction thereof, wherein a portion of the power supply wires to the drive motor are

disposed within said boss means, the improvement comprising said boss means being provided with a notch at the connection



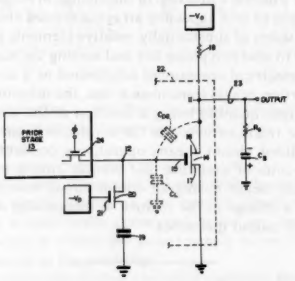
of said boss means to the device so that shearing of said boss means upon being struck by said fragments will be enhanced.

3,909,674

PROTECTION CIRCUIT FOR MOS DRIVER

John R. Spence, Villa Park, and Robert W. Polkinghorn, Orange, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 28, 1974, Ser. No. 455,777
Int. Cl.² H02H *1/04, 7/20*
U.S. Cl. 317—16 **8 Claims**



1. In combination:

an MOS device having gate, source and drain electrodes operative when energized to supply an output voltage signal at said drain electrode in response to a received input voltage signal at said gate electrode;

static charge storage means connected to said drain electrode;

capacitance means;

switching means for selectively connecting said capacitance means to said gate electrode of said MOS device so as to minimize voltage feedback across the drain to gate junction of said MOS device when the device is energized and to isolate said capacitance means from said gate electrode so as to increase voltage feedback across the drain to gate junction of said MOS device in order to protect said MOS device from spurious voltage signals resulting from said static charges applied to said drain electrode when said MOS device is de-energized; and

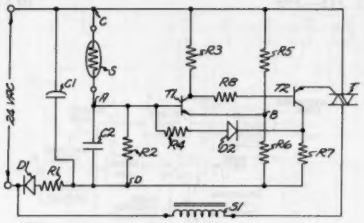
means for supplying a control voltage to said switching means to control the operation thereof.

3,909,675

PROTECTION CIRCUIT

Hans G. Hirsbrunner, Attleboro; Leo A. Plouffe, North Dighton, and Lyle E. McBride, Jr., Norton, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 13, 1972, Ser. No. 314,883
Int. Cl.² H02H *5/04, 7/085*
U.S. Cl. 317—41 **8 Claims**



1. A protection circuit for a device to be protected, which comprises:

a. a switch and a source of power,

b. a bridge circuit means controlling operation of said switch said bridge circuit including a resistor bridge,

c. said bridge circuit means including a PTC temperature sensor means responsive to a predetermined alarm condition,

d. means responsive to said predetermined alarm condition for providing a reset condition different from both said alarm condition and the normal operating condition, said means responsive to said predetermined alarm condition includes resistance means coupled in parallel with another of the legs of said bridge whereby said sensor and the parallel combination of said another of the legs with said resistance means forms a voltage divider,

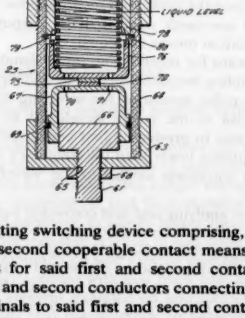
e. and trigger means responsive to unbalance of said bridge to operate said switch.

3,909,676

SELF-OPERATING FAULT CURRENT LIMITER SWITCH

Lorne D. McConnell, Chalfont, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 22, 1974, Ser. No. 462,987
Int. Cl.² H02H *1/00*
U.S. Cl. 317—74 **10 Claims**



1. A self-operating switching device comprising, in combination: first and second cooperable contact means; first and second terminals for said first and second contact means respectively; first and second conductors connecting said first and second terminals to said first and second contact means respectively; housing means for enclosing said first and second

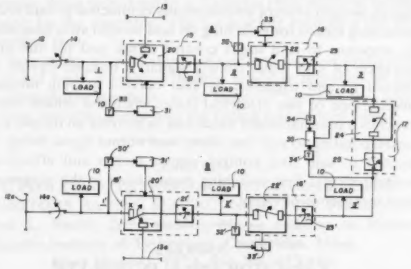
contact means and at least portions of said first and second conductors; said first and second terminals extending through the wall of said housing means; the interior volume of said housing means being filled with a dielectric fluid at least to a level which encloses said first and second cooperable contact means; at least one of said first and second cooperable contact means being movable relative to the other; biasing means connected to said one of said first and second contact means for biasing said first and second contact means to an engaged condition; said first and second contact means and said first and second conductors defining a bent current-carrying path which produces a blow-off force between said first and second cooperable contact means which tends to oppose the force of said biasing means, whereby said first and second contact means are opened when the current in said current-carrying path exceeds a given value; and delay means connected to at least said one of said contact means for delaying the reclosing of said contact means after the opening thereof.

3,909,677

ELECTRICAL DISTRIBUTION NETWORKS INCORPORATING MEANS FOR SECTIONALIZING FAULTED LOAD SECTIONS

James E. McClain, Greenville, Tex., assignor to Esco Manufacturing Company, Greenville, Tex.

Filed Mar. 13, 1974, Ser. No. 450,867
Int. Cl.[2] H02H *7/26*
U.S. Cl. 317—29 R **3 Claims**



1. An alternating current high voltage electrical power distribution network, comprising:

a. a pair of load branches, each branch having first, second and third load section means coupled thereto at spaced locations therealong;

b. a first switching system connecting said first and second load section means; a second switching system connecting said second and third load means; and a third switching system connecting the third load means of each of said pair of load branches with one another;

c. said first switching system comprising first and second series connected switches; the first of said switches having an input, output, and an intermediate terminal, the input terminal connected with said first load section means and the output terminal connected with said second switch, and a switch contactor adapted to transfer the said output terminal from electrical connection with said input terminal to electrical connection with said intermediate terminal in response to a loss of voltage at said input terminal; said second switch being normally closed and adapted to open in response to excessive current therethrough;

d. said second switching system comprising first and second series connected switches, the first of said switches having its input connected to said second load section means and adapted to open in response to a loss of voltage at its said input, the second of said switches being normally closed and adapted to open in response to excessive current therethrough;

e. said third switching system comprising first and second series connected switches, the first of said switches being normally open and adapted to close in response to a loss of voltage at either the input or the output of said third switching system, the second of said switches being normally closed and adapted to open in response to excessive current therethrough;

f. a pair of power sources respectively coupled to each of said branches for providing, during absence of faults in any of said load section means, a preferred source of electrical power to the first, second and third load means of each branch; and

g. auxiliary power sources respectively connected to the intermediate terminal of the first switch of each of said first switching systems;

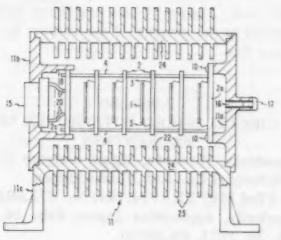
h. said first, second and third switching systems being responsive to faults occurring in any of the first, second and third load section means for isolating the faulted load means while transferring or maintaining the remaining non-faulted load section means in communication with either said preferred sources of power or said auxiliary sources of power.

3,909,678

PACKAGING STRUCTURE FOR A PLURALITY OF WAFER TYPE INTEGRATED CIRCUIT ELEMENTS

Alfred A. Rifkin, Wappinger Falls, and Robert Wallace Staats, Lagrangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 19, 1974, Ser. No. 462,461
Int. Cl.[2] H05K *7/20*
U.S. Cl. 317—100 **2 Claims**



1. An electronic wafer type assembly comprising:

a plurality of wafer type circuit elements having pad portions adapted for electrical connection purposes,

a corresponding plurality of annular wafer support elements disposed parallel and adjacent to said circuit elements,

a plurality of electrical connection pads on each of said wafer support elements,

a plurality of conductive, spring-like, support members affixed at one end to said pad portions on said circuit elements and at the other end to said pad portions on said wafer support elements to provide an electrical connection therebetween,

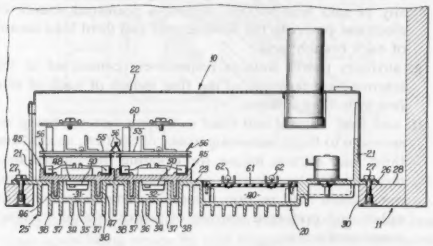
mounting means comprising a plurality of conductive rod members for said wafer support elements holding said support elements in spaced parallel relationship to provide a silo-like assembly and each of said rod members engaging pads on said wafer support elements to establish electrical connections to said support elements, and

a housing surrounding said support members and circuit elements and adapted to retain said circuit elements in a liquid coolant material.

3,909,679
CABINET AND HEAT SINK FOR AMPLIFIER COMPONENTS

Ralph E. Petri, Chicago, Ill., assignor to Rock-Ola Manufacturing Corporation, Chicago, Ill.

Filed Nov. 7, 1974, Ser. No. 521,798
Int. Cl.[2] H05K 7/20
U.S. Cl. 317—100 4 Claims

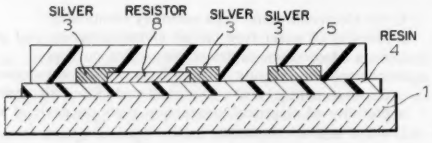


1. In an automatic coin-operated phonograph: a dust sealed cabinet for enclosing the working components of the phonograph, an electronic amplifier mounted within said cabinet and comprising a cast metal chassis having a major base wall formed with a plurality of spaced heat convector fins extending outwardly of one face thereof, said base wall having plural spaced wells opening inwardly of the opposite face thereof; means mounting said chassis over an opening in one wall of said cabinet such that said fins are exposed to atmosphere exteriorly of the cabinet while maintaining the sealed integrity of the latter's interior, thermally conductive heat sink means supporting electronic components mounted on said chassis in thermal conductive relation with said base wall to enclose said wells therein, and plural power transistor means supported on said heat sink means, one enclosed within each of said wells, whereby the heat emission of said transistor means is effectively dissipated to the exterior of the cabinet by said chassis and convector fins.

3,909,680
PRINTED CIRCUIT BOARD WITH SILVER MIGRATION PREVENTION

Eiichi Tsunashima, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 23, 1974, Ser. No. 472,802
Claims priority, application Japan, Feb. 16, 1973, 48-19654; Feb. 20, 1973, 48-20930
Int. Cl.[2] H01C 13/00; H02B 9/00
U.S. Cl. 317—101 C 15 Claims

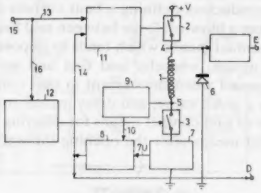


1. In a printed circuit board having at least one surface thereof electrically insulating material and at least one printed electronic component on said surface and at least two conductors on said surface which during operation of the circuit will be at different potentials and at least one of which is connected to said component, said conductors having a composition which is at least partly silver, the improvement comprising a coating layer composed of electrically insulating resin and an organic inhibitor and which is on the surface of said circuit board and covering at least part of the surface of said conductors for inhibiting migration of silver, which is contained in said conductor, from the conductor of higher potential to the conductor of lower potential.

3,909,681
DRIVING CIRCUIT FOR PRINTING ELECTROMAGNET

Alfredo Campari, and Giorgio Vigini, both of Milan, Italy, assignors to Honeywell Information Systems Italia, Caluso, Italy

Filed Nov. 19, 1974, Ser. No. 525,220
Claims priority, application Italy, Nov. 28, 1973, 31771/73
Int. Cl.[2] H01H 47/32; H01F 7/18
U.S. Cl. 317—148.5 R 6 Claims

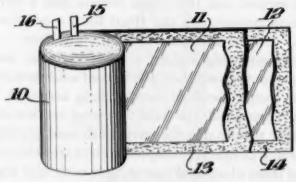


1. Driving circuit for driving an electromagnet coil with a controlled current comprising: first switching means upstream of said coil and connected thereto; second switching means downstream of said coil and connected thereto, current sensing means connected to said coil for sensing the current in said coil; a closed unidirectional current path including said second switching means, said coil and a diode; first control circuit means connected to said first switching means for actuating said first switching means in response to an input control signal; second control circuit means connected to said second switching means for switching on said second switching means in response to said input control signal and for the entire duration of said input control signal; a bistable device connected to and triggered by said current sensing means to assume one of two electrical states when the sensed current reaches a preestablished value and to provide an output signal corresponding to said one state, said output signal being connected to said first control circuit means and effective to switch off said first switching means even in the presence of said input control signal.

3,909,682
CAPACITOR AND ELECTROLYTE

Franz S. Dunkl; Sidney D. Ross, both of Williamstown, and Manuel Finkelstein, North Adams, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Nov. 8, 1974, Ser. No. 522,361
Int. Cl.[2] H01G 9/02
U.S. Cl. 317—230 4 Claims



1. An electrical capacitor comprising a capacitor housing; a capacitance section within the housing, said section having at least a pair of spaced electrodes one of which is coated with a dielectric film; and an electrolyte in contact with said electrodes; said electrolyte consisting essentially of a solvent and a solute prepared from a liquid mixture of a substituted amide and an acid selected from the group consisting of (1) phosphotungstic acid, (2) a combination of salicylic acid and boric acid, (3) a combination of pyrocatechol and boric acid, and (4) a combination of 2,3-naphthalenediol and boric acid, said

mixture being reacted at about 125°C for at least 2 hours and said electrolyte having a low resistivity.

3,909,683

CAPACITOR WITH OVERHEATING PROTECTION

Zdenek Kysely, Aldingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 13, 1974, Ser. No. 479,180

Claims priority, application Germany, July 19, 1973, 2336727

Int. Cl.² H01G 4/40

U.S. Cl. 317—247 7 Claims

1. An electrical capacitor of the type comprising wound electrode and dielectric layers forming a cylindrical body, metallic contact bridges on the end faces of said body for contact with the respective electrode layers, and a disconnecting device responsive to internal over-pressure, all of the foregoing being imbedded in a synthetic resin material within a casing for the assembly, which capacitor embodies the improvement that:

in the vicinity of at least one of said end faces of said cylindrical body a yielding hollow space is provided in the surrounding synthetic resin material between the adjacent metallic bridge and the facing end of said casing.

3,909,684

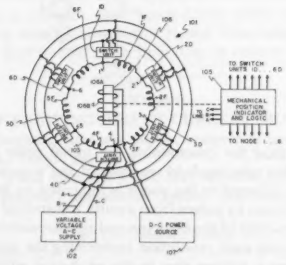
A-C POWERED, THYRISTOR-SWITCHED ELECTRIC MOTORS HAVING SUPERCONDUCTING FIELDS

Joseph L. Smith, Jr., Concord, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 22, 1974, Ser. No. 453,856

Int. Cl.² H02P 5/40

U.S. Cl. 318—138 18 Claims



1. A superconducting motor adapted to connect to an N-phase polyphase a-c power system that comprises, in combination: an armature winding having coils connected in a closed-loop configuration; an M-pole superconducting field electromagnetically coupled to the armature winding; switch means comprising N-pairs of switching devices connected to each armature winding node, one device of the pair being adapted to conduct electric current in to each node of the armature winding and the other device of each pair being adapted to conduct electric current out from each node of the armature winding, each swinging-device pair comprising two thyristors connected in an anti-parallel emitter-to-base configuration; and sensing and logic means connected to determine, in part, the switching times of the switching devices, the switching devices being a function, as well, of the instantaneous voltage of the a-c system, switching being timed to cause the armature magnetic axis to lead the field magnetic axis by about 90 electrical degrees thereby to provide a motor that operates directly from an a-c line yet exhibits the speed control characteristic of a separately excited d-c motor, said sensing means comprising position indicator and logic device means connected to control gate signals to the thyristors and to relate gate signals to the relative angular positions of the two magnetic axes, the gate signal to one thyristor of each pair being derived from a line of the polyphase a-c power system and the gate signal to the other thyristor of the same pair being derived for a winding node.

3,909,685

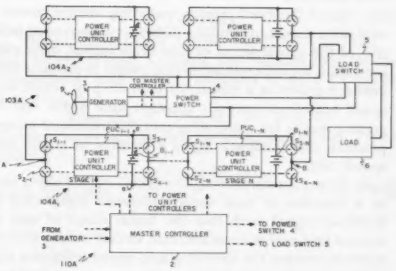
ELECTRICAL APPARATUS

Richard H. Baker, Bedford, and Lawrence H. Bannister, Dedham, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 432,939, Jan. 14, 1974, Pat. No. 3,867,643. This application Oct. 16, 1974, Ser. No. 515,290

Int. Cl.² H02M 7/00

U.S. Cl. 318—139 33 Claims



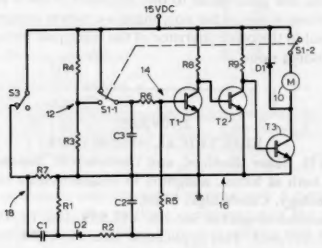
1. Apparatus that comprises a variable-voltage variable-frequency electric power unit that includes a plurality of stages connected in cascade, each stage having supply voltage means, first bilateral switch means and second bilateral switch means, the first bilateral switch means and the second bilateral switch means acting in combination such that the input of the stage and the output of the stage are shorted together and therefore at equal potential, or said supply voltage means is connected between the input and the output such that the output is positive with respect to the input or the output is negative with respect to the input, the supply voltage means in at least one of the stages of the plurality of stages comprising a switched source assembly having a plurality of electric sources that act in concert through electrical interconnection as the supply voltage means of said one of the stages, and means for changing the interconnection of the plurality of electric sources in the switched source assembly, thereby to alter in a determined fashion the voltage and the current available from the switches source assembly and hence from said apparatus.

3,909,686

MOTOR CONTROL SYSTEM WITH EXPONENTIAL REFERENCE SOURCE FOR MAINTAINING A CONSTANT LINEAL SPEED OF A FILM BEING WOUND ON A REEL

Jeffrey A. Brodhag, Arcadia, and Lawrence H. Rehurek, San Gabriel, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed July 2, 1973, Ser. No. 376,055
Int. Cl. G05b *17/02*
U.S. Cl. 318—163 **1 Claim**



1. In a film handling apparatus including a drive motor for driving a take-up reel, a motor control system comprising:

exponential reference circuit means for providing an exponentially changing speed reference signal correlated to the increasing film convolution diameter as film is wound onto said reel;

motor speed feedback means including means driven by said drive motor to produce pulses at a frequency indicative of the actual speed of said drive motor, differentiating means for differentiating said pulses to produce differentiated pulses at a frequency indicative of actual motor speed but of substantially constant time width, and integrating means for integrating said differentiated pulses to produce said feedback signal indicative of actual motor speed; and

circuit means for controlling the speed of said drive motor as a function of said speed reference signal and said feedback signal such that the lineal speed of said web toward said reel is constant, said circuit means including summing means for summing said speed reference signal and said feedback signal to produce an error signal indicative of the difference in magnitude between said signals, and amplifier means for amplifying said error signal to produce a motor control signal.

3,909,687

FLUX CONTROL SYSTEM FOR CONTROLLED INDUCTION MOTORS

Alberto Abbondanti, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 5, 1974, Ser. No. 448,315
Int. Cl.² H02P *5/40*
U.S. Cl. 318—227 **11 Claims**

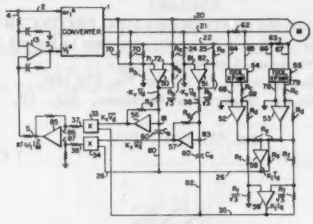
1. A system for controlling the flux of an induction motor driven by a polyphase power supply of variable frequency and variable voltage through motor line terminals, the system comprising:

means for sensing the motor input currents from said line terminals;

means for sensing the motor terminal voltages from said line terminals;

means responsive to said input current sensing means and to said terminal voltage sensing means for generating a synthesized signal representative of W_X where W_X is the motor phase reactive power; and

means responsive to said synthesized signal for controlling



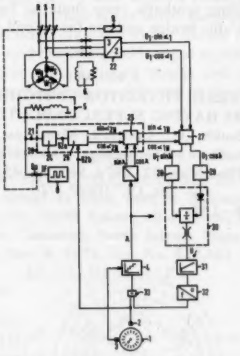
the voltage of said power supply as a function of said reactive power.

3,909,688

METHOD AND APPARATUS FOR DETERMINING THE INITIAL ROTOR ANGLE IN A ROTATING FIELD MACHINE

Felix Blaschke, and Walter Dreiseitl, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 10, 1974, Ser. No. 513,753
Claims priority, application Germany, Oct. 25, 1973, 2353594
Int. Cl.² H02P *5/40*
U.S. Cl. 318—227 **5 Claims**



1. A method for determining the initial rotor angle in a converter fed rotating field machine of the type wherein the rotor angle referred to the stator is indicated by the count of a counter driven by pulses from a pulse transmitter coupled to the magnet wheel of the machine and synchronized by a reference pulse one each revolution comprising the steps of:

a. applying a voltage step to the excitation winding of the rotating field machine with the stator windings turned off;

b. determining from the voltage induced in the stator windings the angular position of the stator voltage vector referred to the stator;

c. providing a network simulating the machine;

d. applying said voltage step to said simulated network;

e. also applying to said network a signal representing the rotor angle stored in the counter;

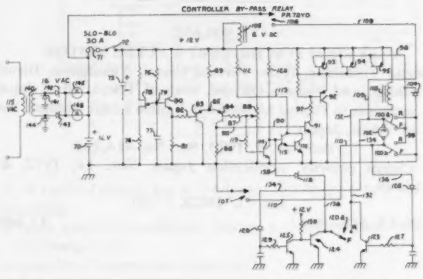
f. determining in said simulated network the angular position of a simulated stator voltage vector referred to the stator;

g. determining the angular difference between the measured angular position of the stator voltage vector and the angular position of the simulated stator voltage vector;
h. changing the count of said counter until the difference between the measured angular position and the angular position of the simulated stator voltage vector agree.

3,909,689
ELECTRICALLY POWERED SELF-PROPELLED WHEELCHAIR AND CONTROL UNIT

James L. Selby, Grandview, Mo., and James N. Shirley, Kansas City, Kans., assignors to Top Quality Tool & Machine Co., Inc., Grandview, Mo.

Filed Jan. 2, 1974, Ser. No. 429,564
Int. Cl.² H02P *7/28*
U.S. Cl. 318—257 **6 Claims**



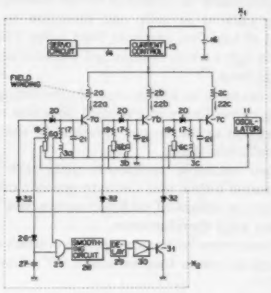
1. An electrically powered motor-driven wheelchair, said wheelchair comprising:
a battery for the production of DC power;
a motor;
motor control means operably connected to said battery for generating a plurality of DC pulses, the pulses being applied to said motor to energize same;
means for reversing the electrical connection of said motor to said control means to thereby reverse the direction of travel of said wheelchair;
means for bypassing said motor control means, said bypassing means permitting operation of said motor under preselected low voltage battery conditions; and
bypass defeat means for preventing the engagement of said bypass means whenever said motor connection reversing means is engaged, said bypass defeat means thereby preventing said motor control means from being bypassed when said wheelchair is operating in reverse.

3,909,690
SELF-EXCITING DIRECT CURRENT MOTORS

Naokatsu Sugiura, Hachioji, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1974, Ser. No. 456,303
Claims priority, application Japan, Mar. 31, 1973, 48-36962
Int. Cl.² H02K *29/00*
U.S. Cl. 318—138 **5 Claims**

1. In a self-exciting direct current motor of the type comprising a rotor having a plurality of magnetic poles in the form of a permanent magnet, a stator positioned about said rotor and having a plurality of magnetic poles respectively wound with field coils and armature coils, starting position detecting means positioned adjacent said rotor and including a plurality of position detecting elements to detect the angular position of the rotor for producing a position signal of the rotor, a selfexciting circuit including amplifier means for amplifying said position signal and the electromotive forces induced in said armature coils in accordance with the rotation of said rotor for supplying the amplified power to said field coils thus causing the rotor to rotate continuously, and means for connecting a position signal and an armature coil to an amplifier means as inputs and for connecting an amplifier means output to a field coil, the improvement which comprises:
means having an armature coil as an input for detecting a signal indicating only the forward rotation of said rotor and providing an output;

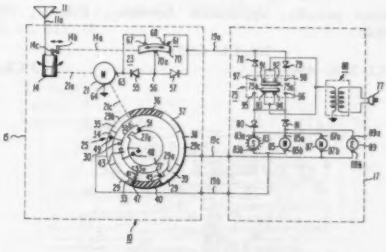


means for converting the output of said signal detecting means into a continuous signal; and
means for supplying said continuous signal to said self-exciting circuit at the end of a predetermined period starting with a point of time at which the signal indicating said forward rotation is detected, thereby effecting the selective operation of said self-exciting circuit so as to amplify only the voltage induced in said armature coils.

3,909,691
DIRECTION INDICATING DISPLAY SYSTEM

Robert Morris Wilson, Vineland, and William John Bachman, Moorestown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,781
Claims priority, application United Kingdom, Jan. 29, 1973, 04322/73
Int. Cl.² G05B *11/14*
U.S. Cl. 318—490 **7 Claims**



1. In an antenna rotator system including a remotely located drive means for rotating an antenna in azimuth and a local control means for controlling the rotated position of the antenna, an indicator system in combination therewith comprising:
at least one pair of conductive strips with said strips arranged in a circle with an insulating gap separating the strips at both opposite ends thereof,
at least four indicator lights with each light having a pair of terminals and when a given one of said lights is illuminated indicating said antenna oriented in azimuth in one of the four major compass directions of north, south, east or west,

a selected first and second of said indicator lights indicating consecutive major compass bearings each having one of its terminals coupled to the first of said pair of conductive strips,

a selected third and fourth of said indicator lights indicating a different pair of consecutive major compass bearings each having one of its terminals coupled to the second of said pair of conductive strips,

means connectable to a source of alternating current for applying current in only one direction to the second terminal of said first and said third lights where said first and third lights when illuminated indicate opposite compass directions,

means connectable to said source of alternating current for applying current only in a second direction opposite said one direction to the second terminal of said second and fourth indicator lights,

at least two rotatable contactors with each arranged to when rotated follow said circle to provide contact of said contactors on either of said two conductive strips or the insulating gaps therebetween,

said two contactors being arranged to contact said conductive strips at points located about 90° of arc from each other,

a first rectifying means coupled between a point of reference potential and a first of said two rotatable contactors to permit current conduction in only said one direction and a second rectifying means coupled between said point of reference potential and the second of said two rotatable contactors to permit current conduction in only said second direction, and

means coupled to said drive means for rotating said contactors relative to said conductive strips so that when said first contactor touches said first conductive strip said first light is illuminated, when said first contactor touches said second strip said third indicator light is illuminated, when said second contactor touches said first strip said second light is illuminated, and when said second contactor touches said second strip said fourth indicator light is illuminated.

3,909,692

MEASURING INSTRUMENT CONTROL

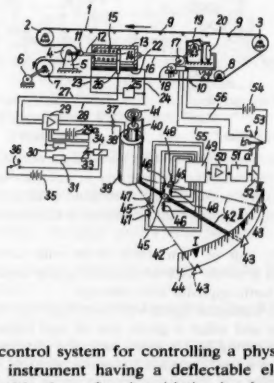
Heinrich Jüngel, Rheinhausen, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Feb. 4, 1974, Ser. No. 439,619

Claims priority, application Germany, Feb. 7, 1973, 2305849

Int. Cl.[2] G05B *1/08*

U.S. Cl. 318—490 **3 Claims**



1. In a control system for controlling a physical factor; a measuring instrument having a deflectable element which varies in position in conformity with the signals supplied to the instrument, a signal developing element operable to develop signals for said instrument and operatively connected to the factor to be controlled thereby, adjusting means for adjusting said factor and therethrough said signal developing means, means actuated by said deflectable element in deflected positions thereof for actuating said adjusting means, signal processing means having an input connected to receive signals from said signal developing element and an output connected to supply signals to said instrument, and selector means connected to said signal processing means and operable to adjust the signal output thereof relative to the signal input thereto, the factor to be controlled being a conveyor belt and the load adjusting means adjusting the tension in said belt, said load adjusting means including a movable pulley about which the belt is entrained, said signal developing means comprising a resistor element adjustable in conformity with movements of said pulley.

3,909,693

SYSTEM FOR DRIVING A PULSE MOTOR

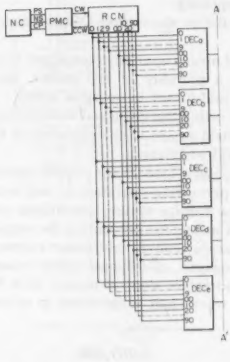
Norito Yoshitake, Hino; Hiroshi Usami, Yokohama; Hiroshi Ishida, and Makoto Ohtomi, both of Tokyo, all of Japan, assignors to Fujitsu Limited and Fujitsu Funac Limited, both of Tokyo, Japan

Filed Nov. 9, 1973, Ser. No. 414,233

Claims priority, application Japan, Nov. 14, 1972, 47-114548

Int. Cl.[2] H02K *37/00*

U.S. Cl. 318—696 **4 Claims**



1. A method for driving an electric pulse motor which provides n exciting coils and moves in response to command pulses, which comprises the steps of

generating selectively, in accordance with said command pulses, n exciting control voltages which have approximate trapezoidal waveforms inclined at the rise and fall portions, said exciting control voltages being generated, in order, with a phase difference which depends on the speed of said command pulses,

amplifying said exciting control voltages respectively by linear current amplifiers each of which is connected respectively to said n exciting coils,

applying the amplified outputs of said linear current amplifiers respectively to said exciting coils of said motor, and thereby smoothing the movement of said electric pulse motor.

3,909,694
CONTROL CIRCUIT FOR A CONDENSER DISCHARGE TYPE WELDER

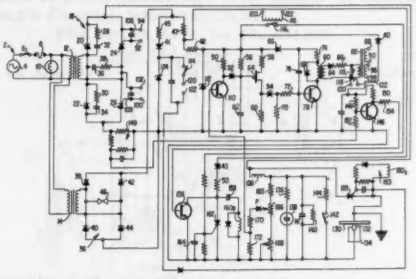
Hiroshi Yokota, Hugisawa, and Humimasa Machida, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Mar. 13, 1974, Ser. No. 450,748

Claims priority, application Japan, Mar. 16, 1973, 48-30635; Mar. 16, 1973, 48-30636; Mar. 16, 1973, 48-30637

Int. Cl.[2] B23K *11/26;* **H02M** *9/06*

U.S. Cl. 320—1 **3 Claims**



1. A control circuit for a condenser discharge type welder comprising:

a large capacity condenser having a charging path and a discharge path;

means for charging said condenser;

a first switching element connected in said discharge path of said condenser;

a second switching element connected in said charging path of said condenser;

a discharge start switch;

means for controlling said second switching element to terminate charging along with operation of said discharge start switch; and

a driving circuit for turning on said first switching element to start discharging after charging is terminated; and

said driving circuit having a common electric path with said discharge path to prevent discharge even when said discharge start switch is closed whenever the welder is not in contact with the material to be welded.

3,909,695
REGULATION AND STABILIZATION IN A SWITCHING POWER SUPPLY

Robert D. Peck, Parsippany, N.J., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 17, 1973, Ser. No. 407,399

Int. Cl.[2] G05F *1/64;* **H02P** *13/24*

U.S. Cl. 321—2 **12 Claims**

1. A regulating device for producing a regulated D.C. voltage comprising:

a pair of input terminals for receiving an input signal;

input means coupled to the input terminals for producing a first D.C. signal in response to the input signal;

switching means coupled to the first input means for producing primary pulses at a predetermined frequency by switching the first D.C. signal on and off;

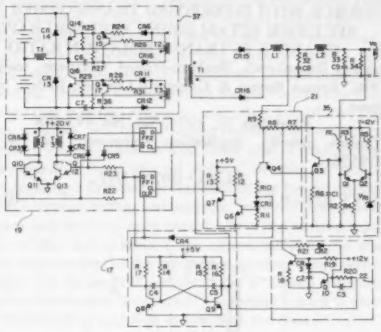
transformer means coupled to the switching means for producing secondary pulses responsive to the primary pulses;

output rectifying means coupled to the transformer means for rectifying the secondary pulses;

first output filtering means coupled to the output rectifying means for filtering the rectified secondary pulses, thereby producing an output D.C. voltage;

first comparison means coupled to the first output filtering means for comparing a D.C voltage sensed at the output of the first output filtering means with a first reference voltage, and producing a trigger signal when the level of the sensed voltage differs from the level of the first reference voltage by a predetermined amount, said comparison means operating to compare the voltages at each cycle of operation;

active circuit means for producing a stabilizing voltage and summing the stabilizing voltage with one of the sensed voltage and the first reference voltage before comparison



of the sensed voltage and the first reference voltage in the comparison means;

pulse width modulating means coupled to the first comparison means and to the switching means for varying the width of the primary pulses produced by the switching means, in response to the trigger signal from the first comparison means; and

oscillating means coupled to the pulse width modulating means for establishing the predetermined frequency of the primary pulses produced by the switching means.

3,909,696
DC-DC CONVERTER

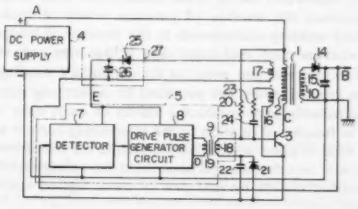
Kazuo Katou, Tokaimura, and Yasuji Kamata, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 26, 1973, Ser. No. 428,020

Claims priority, application Japan, Dec. 27, 1972, 47-129981

Int. Cl.[2] H02M *3/335*

U.S. Cl. 321—2 **7 Claims**



7. A DC-DC converter comprising a first transformer including an input winding, an output winding, a feedback winding and an auxiliary winding separate from the output winding, a switching element connected in series with the input winding of said first transformer, a DC power supply connected to the series circuit of said first transformer and said switching element to make up a closed loop, a drive circuit including a second transformer for causing said switching element to effect on-off operation so as to produce a desired output from the output winding of said first transformer, an oscillation circuit for positively feeding back the output from the feed-

back winding of said first transformer to an input terminal of said switching element, and a rectifier circuit for rectifying the output voltage derived from the auxiliary winding of said first transformer and for applying the rectified voltage as an operating voltage for said drive circuit.

3,909,697

ARRANGEMENT FOR SUPPLYING DIRECT CURRENT TO A CONSUMER FROM AN ALTERNATING CURRENT SOURCE WITH INTERPOSED TRANSFORMER AND RECTIFIER ESTABLISHING PERIODIC RAPID CHANGES IN TRANSFORMATION RATIO

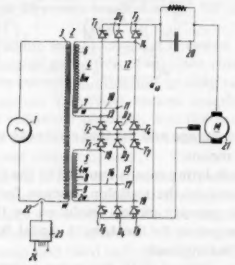
Manfred Depenbrock, Bochum-Stiepel, Germany, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed July 31, 1974, Ser. No. 493,608

Claims priority, application Germany, Aug. 4, 1973, 2339576

Int. Cl.² H02M 7/17

U.S. Cl. 321—8 R 10 Claims



1. In an arrangement for providing direct current to a consumer from a supply source of alternating current which includes a transformer having its primary side connected to said alternating current supply source and its secondary side connected to a rectifier system from which direct current is fed to the consumer through a filter tuned to double the frequency of the alternating current supply source, the improvement wherein the secondary side of said transformer includes at least one winding having at least one tapped junction point intermediate the end junction points thereof, wherein said rectifier system is constituted by a full-wave rectifier bridge for each such tapped secondary winding including non-controllable valves and valves of the controllable semi-conductor type, wherein the number of junction points of each such secondary winding corresponds to the number of bridge-arm pairs, wherein each mid-point of a bridge-arm pair is connected to one junction point of the secondary winding, and wherein control means are provided for selectively actuating the controllable semi-conductor valves of each such bridge circuit in functional relation to the alternating current supply source so as to effect a step-like increase in the transformation ratio of said transformer and hence also the voltage applied to said rectifier system by said one or more tapped secondary windings.

3,909,698

REGULATED AC TO DC CONVERTER HAVING A CONTROLLABLE RECTIFIER ASSEMBLY

Reiner Nill, Mannheim-Wallstadt, Germany, assignor to Brown, Boveri & Cie Aktiengesellschaft, Manheim, Germany

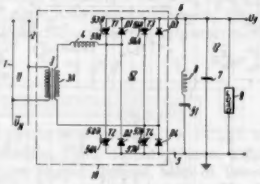
Filed Mar. 25, 1974, Ser. No. 454,699

Int. Cl.² H02M 7/17; G05F 1/68

U.S. Cl. 321—10 7 Claims

1. In an AC to DC converter for transforming an ideally sinusoidal AC input voltage to a filtered DC output, the converter including a rectifying stage transformer-coupled to the AC input voltage and including a plurality of thyration-like switching elements, and ignition control means for regulating the conductive intervals of the switching elements to maintain the DC output within a predetermined range, the improvement wherein:

the converter further comprises, in combination, at least one coil disposed between the output of the coupling transformer and the input of the rectifying stage, and a plurality of diodes individually connected across the switching elements with opposite polarity thereto; and



the ignition control means comprises, in combination, means synchronized with the AC input voltage for generating an AC reference current having a phase corresponding to the AC input voltage and an amplitude proportional to the difference between the DC output voltage of the converter and a desired value, and means for adjusting the conductive intervals of the switching elements in accordance with the instantaneous deviation of the actual AC current through the coil from the AC reference current.

3,909,699

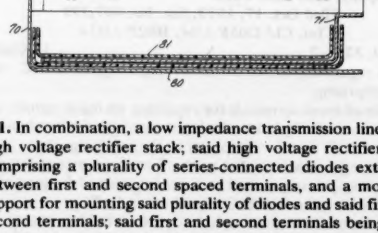
LOW IMPEDANCE TRANSMISSION LINE FOR BYPASSING RADIO FREQUENCY ENERGY AROUND HIGH VOLTAGE RECTIFIER STACKS

Frederick A. Elder, Rancho Palos Verdes, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Sept. 25, 1974, Ser. No. 509,102

Int. Cl.² H02M 1/18

U.S. Cl. 321—11 9 Claims



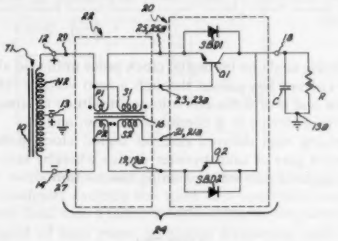
1. In combination, a low impedance transmission line and a high voltage rectifier stack; said high voltage rectifier stack comprising a plurality of series-connected diodes extending between first and second spaced terminals, and a mounting support for mounting said plurality of diodes and said first and second terminals; said first and second terminals being positioned at opposite ends of said mounting support; said low impedance transmission line comprising first and second thin, elongated, closely spaced conductors each having a terminal end and a free end; said terminal ends of said first and second conductors being electrically connected to and mechanically supported by said first and second terminals respectively; said free ends of each of said first and second conductors terminating just short of the terminal end of the other, whereby said first and second conductors are substantially coextensive with

one another and define a low impedance transmission line in parallel with said rectifier stack.

3,909,700
MONOLITHIC SEMICONDUCTOR RECTIFIER CIRCUIT STRUCTURE

Armand P. Ferro, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 18, 1974, Ser. No. 434,580
Int. Cl.[2] H02M *7/20*
U.S. Cl. 321—47 **2 Claims**

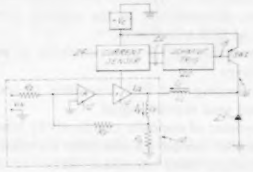


1. A hybrid circuit, suitable for being electrically connected between a power transformer including a secondary winding with a grounded center-tap terminal between two end terminals of said secondary winding and a load including a first terminal and a grounded second terminal, for converting an alternating voltage existing across said secondary winding to d.c. and supplying d.c. to said load, said hybrid circuit comprising: a discrete multi-winding current control transformer unit in combination with a monolithic semiconductor structure; said transformer unit comprising a magnetic core member on which a first primary winding, a first secondary winding, a secondary primary winding and a second secondary winding are wound and magnetically coupled, each of the aforesaid primary and secondary windings having one and other ends, said one ends of the first primary and the first secondary windings having opposite winding polarities and being electrically connected and defining a first input terminal of the hybrid circuit, said one ends of the second primary and the second secondary windings having winding polarities opposite to each other as well as opposite to the corresponding one ends of the first primary and the first secondary windings, said one ends of the second primary and second secondary windings being electrically connected and defining a second input terminal of the hybrid circuit; said monolithic, semiconductor circuit structure comprising an n^+ doped substrate having first and second back-to-back surfaces, an n doped layer epitaxially grown on said first surface of the substrate, said n doped layer having a surface in back-to-back relation with said first surface of the substrate on which the layer is grown, first and second p doped regions diffused in and laterally spaced along said layer and extending from the surface of said layer into said layer toward, but not meeting, the substrate, first and second n^+ doped regions, each being diffused into a different one of the first and second p doped regions and extending from the surface of the p doped region into said p doped region toward, but not meeting, the interface between the p doped region and the n doped layer, each n^+ doped region encompassed, except at the surface thereof, by the p doped region in which it is diffused, first and second laterally spaced metallization regions deposited on and intimately bonded to said surface of the n doped layer and forming thereat first and second metal-semiconductor junctions, said first and second metallization regions comprising anodes of first and second Schottky-barrier diodes, respectively, said first and second n^+ doped regions comprising emitters of first and second npn transistors, respectively, said first and second p doped regions comprising bases of said first and second npn transistors, respectively, said second surface of said n^+ doped substrate comprising common collectors of said first and second npn transistors as well as common cathodes of said first and second Schottky-barrier diodes, first means electrically connecting said surface of said first n^+ doped region and said first metallization region, second means electrically connecting said surface of said second n^+ doped region and said second metallization region, said first means being electrically connected to said other end of said first primary winding, said second means being electrically connected to said other end of said second primary winding, third means electrically connecting said first p doped region to said other end of said first secondary winding, and fourth means electrically connecting said second p doped region to said other end of said second secondary winding, said second surface of said n^+ doped substrate defining a first output terminal of the hybrid circuit, said hybrid circuit being connectable between the power transformer and the load such that the first and second input terminals of the hybrid circuit are connectable to the end terminals, respectively, of the secondary winding of the power transformer and the second surface of the n^+ doped substrate defining the first output terminal of the hybrid circuit is electrically connected to said first terminal of the load.

3,909,701
LINEAR ENERGY CONSERVATIVE CURRENT SOURCE

Glenn C. Waehner, Riverside, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 3, 1974, Ser. No. 511,884
Int. Cl.[2] H03K *17/64, 17/66;* **G05F** *1/56*
U.S. Cl. 323—4 **9 Claims**



1. An energy conservative current source comprising:
a current load;
an amplifier stage connected to said current load at a node and having feedback indicative of current supplied to said node and responsive to an input signal and said feedback to provide current to said load commensurate with said input signal;
a DC power supply and a current sensor connecting said DC power supply to said amplifier stage;
an inductance having one end connected to said current load at said node;
an electronic switch connected between said power supply and the other end of said inductance;
switch control means responsive to current flow between said power supply and said amplifier in excess of a given magnitude for turning on said electronic switch and responsive to current flow between said power supply and

said amplifier of a magnitude less than said given magnitude for turning off said electronic switch; and

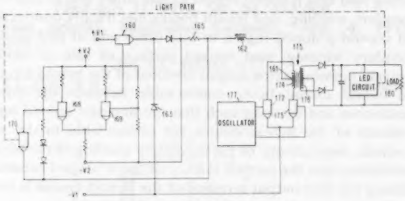
means to provide a path for current flow through said inductance when said electronic switch is turned off.

3,909,702

SWITCHING VOLTAGE REGULATOR WITH OPTICAL COUPLING

Burt E. Hart, Red Hook, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,772
Int. Cl.[2] H02M *3/335*
U.S. Cl. 323—17 **2 Claims**



1. A voltage regulator comprising,

a transformer having a primary winding and a secondary winding, first and second, transistors connected to switch a current through the primary winding to produce in alternating voltage across the secondary winding, means to turn said two transistors on and off alternately, and means for connecting said secondary winding to supply a voltage to a load,

means for comparing said load voltage with a reference and for providing a first signal according to the difference between the load voltage and the reference,

a third transistor connected to supply said current to said transformer and a resistor connected to provide a second signal proportional to said current,

a differential amplifier having fourth and fifth transistors of a first conductivity type, and means connected to provide a current differentially to the emitter terminals of said fourth and fifth transistors,

means connecting said fourth transistor to receive a reference voltage,

means connecting said fifth transistor to receive said first signal and said second signal,

a sixth transistor of opposite conductivity type connected in the collector circuit of said fifth transistor to limit the current in said third transistor, and

means connecting the collector terminal of said fourth transistor to control said third transistor to supply said current to said transformer at a value to maintain said load voltage.

3,909,703

LOW POWER GATE SWITCHING DEVICE FOR TRIACS

Walter B. Braddock, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed July 17, 1974, Ser. No. 489,398
Int. Cl.[2] G05F *3/04*
U.S. Cl. 323—19 **15 Claims**

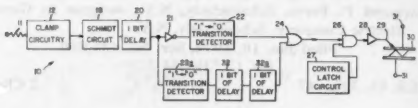
1. A low power method for triggering an electronic semiconductor thyrister device used as a switch in a generally sinusoidal alternating current circuit comprising the steps of:

a. generating two series of in-phase digital clock pulses having a period of one bit which is much shorter than the period of said alternating current and not necessarily synchronized therewith;

b. clamping a sample of said alternating current to a zero reference voltage and to a low direct current voltage compatible with low power solid state digital circuitry to produce a generally trapezoidal waveform having the period of said alternating current;

c. shaping said trapezoidal waveform into generally a square wave having the same period of said alternating current;

d. selecting a next-in-time one bit digital clock pulse each time said square wave has gone through a voltage amplitude transition;



e. delaying said one bit digital clock pulse until said alternating current has passed through a zero voltage reference point and is of sufficient voltage amplitude to sustain said thyrister device in a conduction mode; and

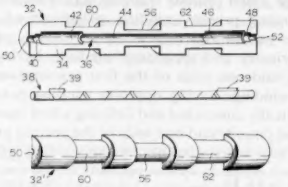
f. applying said delayed one bit digital clock pulse to a control gate of said thyrister device whereby said device is triggered into self sustaining conduction.

3,909,704

MAGNETIC LOCATOR HAVING SENSOR UNITS WITH TWO-PIECE HOUSINGS AND TUBULAR CORES

Erick O. Schonstedt, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Continuation-in-part of Ser. No. 303,598, Nov. 3, 1972. This application Apr. 29, 1974, Ser. No. 465,357
Int. Cl.[2] G01R *33/02*; **G01V** *3/08*; **H01F** *27/30*
U.S. Cl. 324—3 **8 Claims**



1. A magnetic sensor comprising a housing having an elongated cylindrical cavity containing a tubular cylindrical magnetic core, said housing comprising a pair of elongated nonmagnetic housing sections having mating longitudinal planar surfaces and having longitudinal semi-cylindrical recesses which cooperate to form said cavity, the end portions of the recesses being dimensioned to engage the end portions of the core snugly and the intermediate portions of the recesses having larger cross-dimensions than the end portions of the recesses and providing clearance between the central part of the core and the housing, the housing sections having means forming axially aligned openings connecting the ends of the cavity to the outside of the housing, said openings having cross-dimensions less than the cross-dimensions of the end portions of the core and being juxtaposed with the end extremities of the core, said sensor further comprising an excitation conductor passing axially through said openings and through said core for providing a magnetic excitation field coupled to said core.

3,909,705
METHOD OF AND DEVICE FOR RECORDING SPIN RESONANCE SPECTRA

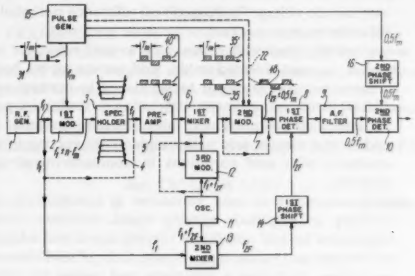
Werner Tschopp, Forch, Switzerland, assignor to Messrs. Spectrospin AG, Switzerland

Filed July 30, 1973, Ser. No. 383,657

Claims priority, application Germany, July 30, 1972, 2237891

Int. Cl.² G01R *33/08*

U.S. Cl. 324—.5 R **9 Claims**



1. A method of recording spin resonance spectra, comprising periodically exciting the spins of a specimen located in a magnetic field with a pulse-modulated radio-frequency excitation signal of high pulse repetition frequency such that the pulses follow one another so closely that only a specific spin type is excited, processing the signal furnished by the excited spins in the pulse intervals of the excitation signal in such a manner that said signal is suppressed at least for the duration of the pulses of said excitation signal and that its phase position changes 180° from pulse to pulse, and detecting the processed signal.

3,909,706
METHOD FOR MEASURING A ROTATIONAL VELOCITY AND A GYROMETER FOR THE PRACTICAL APPLICATION OF SAID METHOD

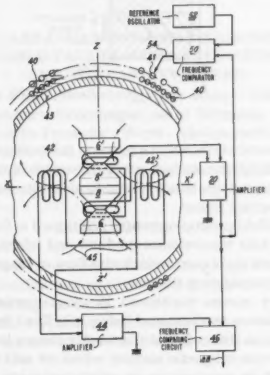
Jean Grescini, Domene; Henri Gleñat, Biviers, and Anteine Salvi, Fontaine, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sept. 5, 1973, Ser. No. 394,415

Claims priority, application France, Sept. 20, 1972, 72.33326

Int. Cl.² G01Y *33/08*

U.S. Cl. 324—.5 E **16 Claims**



1. A gyrometer comprising:

means for producing a homogeneous, steady directing magnetic field H_o in the direction about which a rotational velocity is to be measured;

means including a magnetic resonant material disposed to rotate in said field at said velocity for generating during rotation a first electrical signal having frequency ω, where ω equals the Larmor frequency of said material $\gamma H_o'$, where H_o' equals H_o plus any external perturbational field components;

means disposed to rotate in said field for generating during rotation a second electrical signal having frequency ω', where ω' equals $\gamma H_o'$ plus said rotational velocity; and

means for measuring the difference between the frequency ω' of said second signal and the frequency ω of said first signal.

3,909,707
FREQUENCY RATIO INDICATING CIRCUIT ARRANGEMENTS

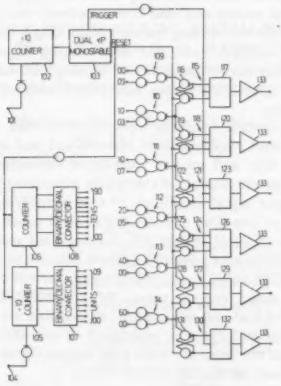
Peter Chadwick, Stockport, England, assignor to Ferranti, Limited, Hollinwood, England

Filed May 10, 1974, Ser. No. 469,020

Claims priority, application United Kingdom, May 11, 1973, 22654/73

Int. Cl.² G01P *3/56;* **G08B** *21/00;* **G01R** *23/14*

U.S. Cl. 324—161 **10 Claims**

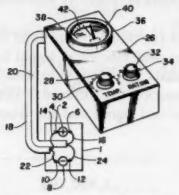


1. A frequency ratio indicating circuit arrangement, operable to indicate within which one of a number of ranges lies the ratio of the pulse repetition frequencies of two pulse trains, comprising first and second input terminals each arranged to receive pulses from an individual pulse train, first counting means operable to count the pulses applied to the first input terminal and to produce a timing signal after a predetermined number of pulses have been counted, second, resettable, counting means having a plurality of output terminals and operable to count pulses applied to the second input terminal to produce at selected output terminals, at predetermined stages in the count, range signals representative of the number of pulses counted, output means comprising a plurality of triggerable output devices each capable of being placed in a SET stage or a RESET state and operable to produce an indication signal if triggered when in a SET state, gating means responsive to the range signals from the second counting means both to SET a different output device at each of said predetermined stages in the count and to RESET a previously SET output device, and control means responsive to the timing signal of the first counting means to apply a triggering signal to all of the output devices and thereafter to apply a RESET signal to the second counting means and to all of the output devices.

3,909,708
ELECTRONIC BATTERY TESTING DEVICE

Keith S. Champlin, 5437 Elliot Ave., South, Minneapolis, Minn. 55417

Filed Jan. 2, 1974, Ser. No. 430,254
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—29.5 23 Claims



1. An electronic device for providing a qualitative assessment of the capacity of a direct current source of electricity to supply power to a load comprising:

a. electrical means providing a time-varying signal;

b. amplifying means for amplifying signals derived from a time-varying voltage developed across said direct current source of electricity,

c. at least two electrical connecting means constructed and arranged for interconnecting said amplifying means, said electrical means and said direct current source of electricity, said connecting means conducting a time-varying current derived from said time-varying signal through said direct current source and sensing said time-varying voltage developed across said direct current source of electricity;

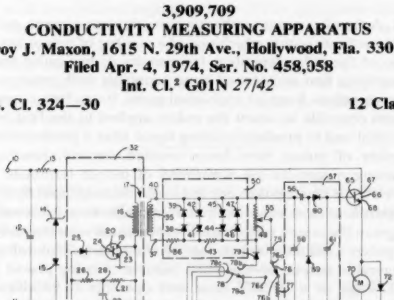
d. display means operably connected to said amplifying means, said display means constructed and arranged to denote first and second qualitative conditions of said direct current source of electricity according to whether the output signal amplitude of said amplifying means is greater or less than a particular critical value; and

e. settable control means for varying said output signal amplitude of said amplifying means relative to said particular critical value in accordance with the electrical rating of said direct current source of electricity, the relative setting of said settable control means linearly related to the reciprocal dynamic resistance of said direct durrent source at the level at which said output signal amplitude equals said particular critical value.

3,909,709
CONDUCTIVITY MEASURING APPARATUS

Leroy J. Maxon, 1615 N. 29th Ave., Hollywood, Fla. 33020

Filed Apr. 4, 1974, Ser. No. 458,058
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—30 12 Claims



1. An electrical apparatus for measuring variations in conductivity of an element having a first conductivity wherein said variation is due to the presence, type and amount of a material in said element having a second conductivity, said element being contained in an electrically conductive container, said apparatus comprising:

a shielded cable, the electrical shielding thereof adapted to electrically connect said electrical apparatus ground to said container, an oscillator for generating an AC signal; coupling means coupled to said oscillator for developing a reference potential in response to said AC signal, said coupling means including a voltage limiting network comprised of a plurality of parellel rectifier circuits each comprised of a plurality of rectifiers and adapted to provide failsafe voltage limiting of said reference potential to 1.4 volts peak to peak;

sensor means electrically connected to said reference potential via said shielded cable, said sensor means being constructed and arranged to be placed in contact with said element, said element completing a conductive path between said container and said reference potential via said sensor means, said path conductivity varying in accordance with said variations in conductivity of said element;

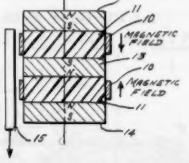
means responsive to said variations in conductivity for creating an amplitude varying signal; indicator means responsive to said amplitude varying signal and adapted to indicate said variations in conductivity of said element; test means including a resistance and means for selectively disconnecting said sensor means from said reference potential and connecting said resistance to said reference potential whereby a predetermined potential is applied to said means for creating said amplitude varying signal; and

variable resistance means for adjusting said predetermined potential.

3,909,710
MAGNETIC SURFACE WAVE ROTATION RATE SENSOR USING THE SAGNAC EFFECT

Ronald G. Newburgh, Belmont; Philipp Blacksmith, Concord, and James C. Sethares, Waltham, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 14, 1974, Ser. No. 433,179
Int. Cl. G01r 33/00
U.S. Cl. 324—34 R 3 Claims



1. A magnetic surface wave rotation rate sensor comprising an annular magnetic surface wave transmission medium, said transmission medium being rotatable about its major axis and in a fixed inertial frame,

magnetic field producing means positioned in fixed relationship to said transmission medium and adapted to induce clockwise and counterclockwise flow of magnetic surface waves propagating thereon,

transducer means positioned in close proximity to said transmission medium and being in a fixed frame relative to rotation thereof, said transducer means being adapted to generate magnetic surface waves on said transmission medium in response to an electromagnetic wave input and to generate first and second electromagnetic wave output signals in response to clockwise and counterclock-

wise magnetic surface waves propagating on said transmission medium,

a source of electromagnetic wave energy connected to said transducer means, and

detector means connected to said transducer means adapted to process said first and second electromagnetic wave output signals as a measure of relative motion between said transmission medium and said transducer means.

3,909,711

TRANSDUCER FOR SENSING A VARIATION OF A MAGNETIC FIELD ON A CONVEYOR BELT

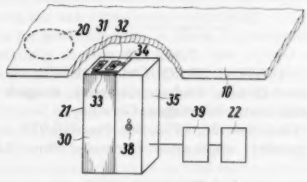
Kunibert Bauer, Nagold, and Manfred Guttinger, Leinfelden, both of Germany, assignors to Sandco Ltd., Canada

Continuation of Ser. No. 275,153, July 26, 1972, abandoned. This application Apr. 25, 1974, Ser. No. 464,325

Claims priority, application Germany, July 28, 1971, 2137700

Int. Cl.² G01R *33/02*

U.S. Cl. 324—43 R **20 Claims**



1. A transducer for sensing the occurrence of a variation of a magnetic field on an article, and more particularly for sensing a magnetized spot on a steel belt traveling at a low speed, the transducer comprising at least one semiconductor diode responsive to a magnetic field, said diode being connected to supply voltage means and providing an output signal to a high resistance input of an amplifier means via an alternating current coupling means, said coupling means being a nonelectrolytic capacitor of small capacitance connected to said diode and said amplifier means, said supply voltage means including stabilizing means, said amplifier means being provided with a low pass characteristic for determining low frequency variations of a magnetic field and being provided with an upper cutoff frequency in the range of 1 to 10 kc.

3,909,712

CIRCUIT ARRANGEMENT FOR MEASURING HIGH OHMIC CABLE FAULTS IN TELECOMMUNICATION AND SIMILAR NETWORKS

Wolfdietrich Rietz, Monkeberg; Otto Knutz, Klausdorf, and Erhard Neubert, Kronshagen, all of Germany, assignors to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Kiel, Germany

Filed Mar. 22, 1974, Ser. No. 453,752

Claims priority, application Germany, Apr. 6, 1973, 2317304

Int. Cl.² G01R *31/11*

U.S. Cl. 324—52 **8 Claims**

1. A circuit arrangement for measuring high ohmic faults in telecommunication and similar network cables comprising:

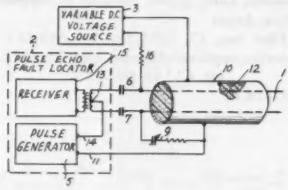
a. a D.C. voltage source;

b. a first pair of conductor means for connecting said D.C. voltage source to first and second conductors in said cable;

c. a pulse echo fault locator, said pulse echo fault locator comprising a pulse generator and a receiver including a differential transformer;

d. a second pair of conductor means for connecting said pulse generator to said first conductor in said cable and said differential transformer respectively;

e. a third pair of conductor means, each including a capacitor, for connecting said differential transformer to said second conductor and a third conductor in said cable; and



f. circuit means including a resistor and a capacitor for connecting said first and third conductors in said cable;

g. whereby both a D.C. voltage and a pulse may be applied to said conductors in said cable, and the pulse reflected by a fault in said cable can be detected and measured by said receiver to determine the location of said fault in said cable.

3,909,713

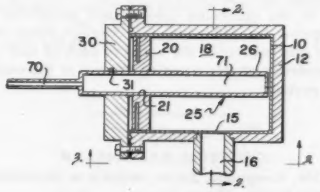
DEVICE FOR MEASURING BIAXIAL STRAIN

Thomas R. Billeter, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 26, 1974, Ser. No. 464,427

Int. Cl.² G01R *1/04*

U.S. Cl. 324—58.5 C **5 Claims**



1. A device for measuring the biaxial strain of a test specimen having an electrically conductive outer surface, comprising:

a high-frequency electromagnetic energy source capable of transmitting energy,

a hollow housing having electrically conductive inner walls, one of said inner walls being movable with respect to the other inner walls and having therethrough a hole, said test specimen being inserted through said hole and rigidly coupled to said movable wall to form a coaxial resonant cavity with the test specimen being the inner conductor and said inner walls of said housing being the outer conductor of said coaxial cavity, said coaxial cavity being of such dimensions that it has at least two resonant frequency modes with the frequency of the first of said resonant modes being dependent upon the length and radial dimension of said inner conductor and with the frequency of a second of said resonant modes being dependent upon the radial dimension of said inner conductor,

means coupled to said coaxial cavity and said source for communicating thereto energy from said source to excite said cavity to resonate at said first and second resonant modes, and

detection means coupled to said cavity and being responsive thereto to provide outputs representative of the frequencies at which the cavity is resonating in said first and second modes.

3,909,714

FREQUENCY MEASURING CIRCUIT

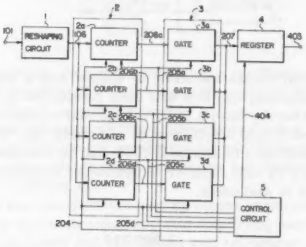
Yoshiaki Nakano, Gifu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 17, 1973, Ser. No. 389,157

Claims priority, application Japan, Aug. 23, 1972, 47-84746

Int. Cl.² G01R *23/02*

U.S. Cl. 324—78 D **3 Claims**



1. A frequency measuring circuit comprising an input terminal, a plurality of counters each having an input connected in parallel to said input terminal for simultaneously receiving the same portions of a train of pulses to be counted and an output terminal and each having the same counting period, register means connected to the output terminals of each of said counters to store, upon receipt of a storage signal, the count thereof, and circuit means connected to said counters for sequentially delaying the beginning of the counting of each of said counters a predetermined time beyond the beginning of counting of the preceding counter and connected to said register means for producing said storage signal to cause storage in said register of the count of each of said counters upon completion of the counting thereof at the end of said counting period.

3,909,715

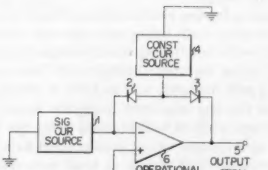
COUNTING-RATE METER

Minoru Oda, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1973, Ser. No. 405,161

Int. Cl.² G01R *23/02*

U.S. Cl. 324—78 **4 Claims**



1. A counting-rate meter comprising, in combination, signal current generator means having two ends and connected at one end to ground to respond to a measured counting-rate of pulses to generate a signal current proportional thereto, an operational amplifier connected at one input to the other end of said signal current means, the other input connected to ground and an output, a pair of first and second sources of constant current having two ends each and connected at one end to ground, a first NPN transistor including a collector electrode connected to the other end of said signal current generator means, an emitter electrode connected to said first source of constant current at the other end, and a base electrode connected to said output of said operational amplifier, a second NPN transistor including a collector electrode connected to a positive source terminal, an emitter electrode connected to the emitter electrode of said first transistor and a base electrode connected to said second source of constant current at the other end, a third NPN transistor including a collector electrode connected to the other end of said second source of constant current, an emitter electrode connected to ground and a base electrode connected to the base electrode of said second transistor, an output terminal, a fourth NPN transistor including a collector electrode connected to said output terminal, an emitter electrode connected to ground and a base electrode connected to said output of said operational amplifier, a constant current from said first source having a magnitude preset to a saturation magnitude of a current resulting from a counting loss of the signal input current at a high frequency of measured pulse thereby to automatically correct the counting loss while said second source of constant current provides a reference voltage for said fourth transistor thereby to produce a linear output at said output terminal.

3,909,716

DIGITAL FREQUENCY METER

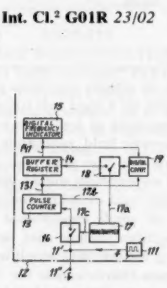
Hermann-Josef Diekers, Einigen, Germany, assignor to Wandel u. Goltermann, Reutlingen, Germany

Filed Nov. 26, 1973, Ser. No. 418,973

Claims priority, application Germany, Nov. 24, 1972, 2257578

Int. Cl.² G01R *23/02*

U.S. Cl. 324—78 D **7 Claims**



1. A system for measuring the output frequency of a source of recurrent pulses, comprising:

a metering circuit connected to receive the pulses of said source;

a normally closed gate in said circuit;

programming means connected to said gate for repeatedly opening same to establish a measuring interval;

a pulse counter in said circuit connected to said source by way of said gate, said programming means being connected to said counter for setting same to zero before each measuring interval;

a buffer register in said circuit connected to said counter and loadable by the latter in response to an updating signal emitted by said programming means between measuring intervals; and

digital indicator means connected to said register for displaying the contents thereof;

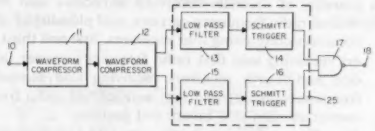
said register being provided with a control input connected to said programming means for receiving said updating signal therefrom, further comprising blocking means in the connection between said programming means and said control input, and comparison means with input connections to the outputs of said counter and of said register for deactivating said blocking means only in the presence of a difference greater than a unit count be-

tween the reading of said counter and the contents of said register.

3,909,717
CIRCUIT FOR ENHANCING RESOLUTION IN TACHOMETER SIGNALS

Donald J. Gazzano, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 371,044, June 18, 1973, abandoned.
This application Apr. 22, 1974, Ser. No. 462,898
Int. Cl.² G01P *3/48;* **H03K** *5/00;* **H04B** *1/40*
U.S. Cl. 324—166 **10 Claims**



1. A circuit for enhancing the resolution of a tachometer signal whose magnitude sinusoidally varies about an axis by determining the axis crossovers, comprising:

a means for generating two in phase representations of said sinusoidally varying signal with one of said representations inverted in sign with respect to the other;

a dual branch circuit, one of said representations being introduced to each of said branches, each branch of said circuit comprising a means for generating a pulse representative of a selected portion of the cycle of said representation introduced therein, said selected portion represented by the pulse generated by said means of one branch occurring at a time different from the occurrence of the selected portion represented by the pulse generated by the means of the other branch; and

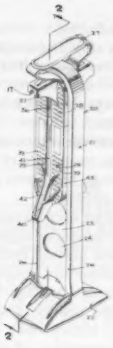
means for receiving said pulses from said dual branches and responsive to each pulse representative of a selected portion of the cycle to initiate the generation of a signal and to the following pulse representative of another selected portion of the cycle to terminate the generation of said signal and thereby produce a signal representative of the axis crossovers of said sinusoidally varying signal.

3,909,718
ICE SKATE HOLDER

Ivor J. Allsop; Jon I. Allsop; Michael G. Allsop, and James D. Allsop, all of P.O. Box 23, Bellingham, Wash. 98225

Filed Jan. 21, 1974, Ser. No. 435,020
Int. Cl.² A47F *7/16*
U.S. Cl. 224—45 S **4 Claims**

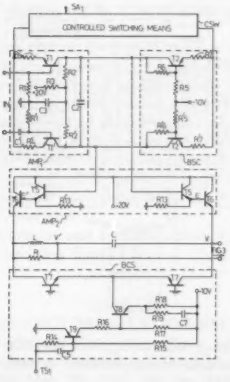
1. An adjustable holder for supporting a pair of ice skates by the blades comprising an elongated frame, a base affixed to one end of said frame, said frame including an intermediate flat portion having longitudinally extending channels therein, a handle connected to said frame at the end opposite said base, a pair of first platforms mounted on opposite sides of said frame adjacent said handle, interengaging stop means on said first platforms and said frame for maintaining said first platforms in fixed position relative to said frame, each of said first platforms having a longitudinally extending centrally disposed groove therein for selectively snugly receiving and restraining portions of an ice skate blade, a pair of second platforms having outwardly disposed projections slidably engaging the channels of said frame, each of said second platforms having a longitudinally extending groove therein for selectively receiving portions of the ice skate blades, outwardly extending support members rigidly connected to each of said platforms, said support members being arranged in alignment with respect to each other, each of said support members having a recessed portion that is aligned with said grooves for receiving and engaging end portions of the ice skate blades and restraining outward movement of the skate in a direction generally normal to said grooves, and resilient means carried by said platforms for normally urging the second platform on each side of said frame toward the first platforms, whereby an ice skate blade is selectively received and clamped in said grooves and the recessed portions of said support members and longitudinal and lateral movement and movement in a direction normal to said grooves is restrained.



3,909,719
BALANCED PCM ENCODER

Jean Victor Martens, Deurne-Antwerp, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 5, 1973, Ser. No. 422,126
Claims priority, application Belgium, Dec. 29, 1972, 793482
Int. Cl.² H04B *1/00, 7/00*
U.S. Cl. 325—38 B **15 Claims**



1. A pulse code modulation encoder of the feedback comparator type to encode a plurality of sequential analog signal samples comprising:

an input amplifier circuit including

an input for said samples,

a first amplifier coupled to said input, and

switching means coupled to said first amplifier to select one of a high and a low gain value for said first ampli-

fier, said switching means having a variable impedance coupled across the output of said first amplifier;

a storage circuit including

a second amplifier coupled to the output of said first amplifier, said second amplifier being a first differential amplifier having two output terminals, and

a storage reactance coupled between said two output terminals; and

an encoding circuit including

a second differential amplifier coupled across said storage reactance to deliver differential current outputs proportional to the magnitude of the voltage presently stored in said storage reactance in response to a present one of said samples,

input terminals to deliver a succession of current inputs proportional to the magnitude of the voltage previously stored in said storage reactance in response to a previous one of said samples,

first means coupled to said second differental amplifier and said input terminals to algebraically add said current outputs to said current inputs, and

a binary voltage comparator coupled to said first means to receive a balanced voltage from said first means proportional to the results of said algebraic addition and to provide a binary code at the output of said comparator representative of the magnitude of said balanced voltage;

said switching means rendering said first amplifier inoperative during the time said present one of said samples is being stored in said storage reactance to prevent crosstalk between said present one of said samples and the next succeeding one of said samples.

3,909,720

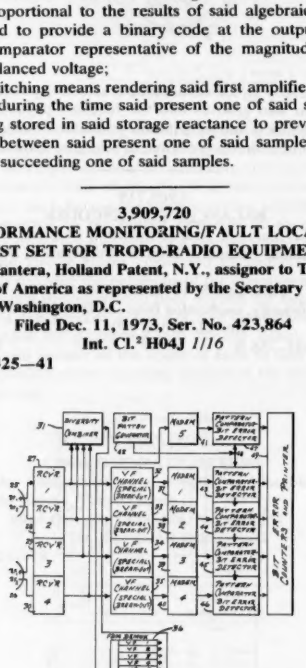
PERFORMANCE MONITORING/FAULT LOCATION TEST SET FOR TROPO-RADIO EQUIPMENT

Italo A. Fantera, Holland Patent, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 11, 1973, Ser. No. 423,864

Int. Cl.[2] H04J 1/16

U.S. Cl. 325—41 **1 Claim**



1. a performance monitoring/fault location test apparatus for troposcatter radio communication systems comprising in combination

a bit pattern generator to provide a binary test pattern said binary test pattern containing a predetermined binary code,

an FDM/FM transmitter unit being connected to said bit pattern generator to receive said binary test pattern, said FDM/FM transmitter unit having a plurality of voice channels and a modem unit, said modem unit being connected to one of said plurality of voice channels, said modem unit digitally modulating said binary test pattern for compatibility with said voice channels and applying said binary test pattern into one of said plurality of voice channels, said plurality of voice channels having voice transmissions therein, said binary test pattern and said plurality of voice transmissions being modulated by an FM modulator to provide a modulated output signal, a first and second frequency carrier generator and translator means to provide first and second radio frequency carriers, and further translating up said modulated output signal to said first and second radio frequency carriers within said first and second radio frequency carrier generator and translator means, said first and second radio frequency carriers being transmitted by said FDM transmitter unit,

a plurality of diversity receivers to receive said first and second radio frequency carriers, said plurality of diversity receivers comprising four receivers, first and third receivers receiving said first radio frequency carrier, and second and fourth receivers receiving said second radio frequency carrier, said first and second radio frequency carrier contain said binary test pattern,

a diversity combiner unit connected to said four receivers to receive the outputs of said four receivers to provide a combined output,

a plurality of voice frequency channel units, each to receive the output of a corresponding receiver respectively, said combined output being applied to a further voice frequency channel unit, said plurality of voice frequency channel units and said further voice frequency channel unit providing said modulated binary test pattern as an output signal,

a plurality of modem units connected respectively to said plurality of voice frequency channel units, said plurality of modem units demodulating said binary test pattern to provide a binary code output.

means for generating a local test pattern and,

a plurality of pattern comparator-bit error detector unit to compare said binary code outputs respectively with said local test pattern to detect differences, said differences being bit errors, said bit errors providing an indication of the performance of said troposcattered radio communication system.

3,909,721

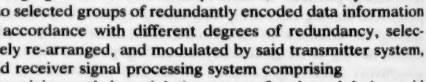
SIGNAL PROCESSING SYSTEM

Julian J. Bussgang, and Herbert Gish, both of Lexington, Mass., assignors to Signatron, Inc., Lexington, Mass.

Continuation of Ser. No. 222,193, Jan. 31, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 446,782

Int. Cl.[2] H04B 1/66

U.S. Cl. 325—41 **23 Claims**



14. A receiver signal processing system for processing a received signal which has been transmitted over a communication channel from a transmitter signal processing system which received signal is a modulated signal representing an analog signal which has been quantized, redundantly encoded into selected groups of redundantly encoded data information in accordance with different degrees of redundancy, selectively re-arranged, and modulated by said transmitter system, said receiver signal processing system comprising

receiving and demodulating means for demodulating said received signal to produce a demodulated information signal;

means for reforming said demodulated information signal to produce a redundantly encoded information signal;

means for decoding said redundantly encoded information signal in accordance with said different degrees of redundancy to produce decoded quantized data information;

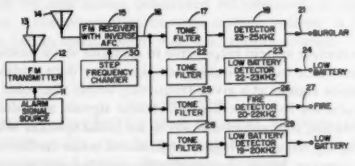
means responsive to said quantized data information for producing an analog signal substantially representing the analog signal processed by said transmitter signal processing system.

3,909,722

VARIABLE FREQUENCY COMMUNICATION SYSTEM

Victor A. Bennett, Jr., Gloucester, Mass., assignor to JBH Electronic Systems, Inc., Burlington, Mass.

Filed June 22, 1973, Ser. No. 372,641
Int. Cl.[2] H04B *7/00*
U.S. Cl. 325—45 **9 Claims**



1. Variable frequency communicating apparatus comprising,

means for radiating a low power frequency modulated signal having a power output of 100 milliwatts maximum,

means for deviating the frequency of said signal over a bandwidth than spans a plurality of adjacent FM broadcast channels at a rate at least equal to an audio frequency,

and receiving means tuned to a center frequency in the FM band that is clear of standard FM broadcast signals detectable by said receiving means for providing tones representing the modulated signal and

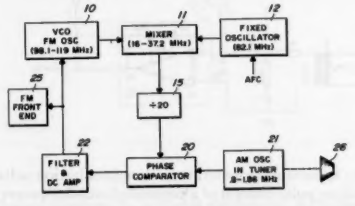
said receiving means having means for selectively passing said tones within a predetermined bandwidth for selectively detecting the rate at which said deviation occurs.

3,909,723

FM/AM RADIO RECEIVER TUNING APPARATUS

Peter St. Clair Manson, Barrington, Ill., and Basil P. Hooten, Northville, Mich., assignors to Motorola, Inc., Chicago, Ill.

Filed Aug. 5, 1974, Ser. No. 494,666
Int. Cl.[2] H04B *1/06, 1/16*
U.S. Cl. 325—315 **7 Claims**



1. FM/AM radio receiver tuning apparatus comprising:

a. an AM oscillator and means for tuning said AM oscillator through a predetermined range;

b. an FM radio receiver front end including an FM oscillator, an FM antenna circuit and RF circuits each including voltage sensitive means for electronically tuning said FM oscillator and remaining FM circuits to predetermined frequencies in response to predetermined voltages being applied thereto;

c. a fixed oscillator;

d. a mixer connected to said FM oscillator and said fixed oscillator for receiving signals therefrom and providing an output signal having a frequency which is a heterodyne or beat frequency of the frequencies of the two input signals;

e. a phase comparator having two inputs and an output with one input connected to receive a signal from said AM oscillator;

f. means connecting the output of said mixer to the second input of said comparator; and

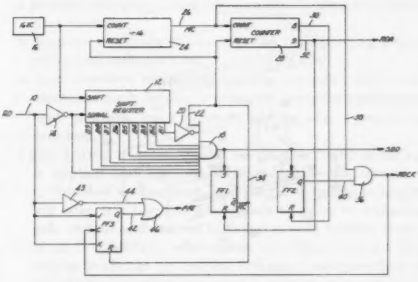
g. means connecting the output of said comparator to the voltage sensitive means of said FM oscillator, FM antenna circuit and RF circuits for providing a predetermined voltage thereto in response to said AM oscillator being tuned to a predetermined frequency.

3,909,724

START BIT DETECTOR AND DATA STROBER FOR ASYNCHRONOUS RECEIVER

James J. Spoth, Euclid, and Robert J. Robbins, Walten Hills, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed June 26, 1973, Ser. No. 373,772
Int. Cl. H04b *1/10;* **H04l** *7/08*
U.S. Cl. 325—321 **6 Claims**



1. A character start bit detector for an asynchronous receiver which receives digital data of predetermined bit rate, said detector comprising:

clock generator means for providing clock signals at a clock rate which is a predetermined multiple of said bit rate,

memory means for storing sample signals representative of the received digital data at said clock rate,

means for decoding said sample signals stored in said memory means and providing a start bit detection signal in response to a predetermined consecutive number of said stored sample signals being of the same logic level and at least one of said stored sample signals being of the opposite logic level, and

means for inhibiting said decoding means in response to said start bit detection signal.

3,909,725

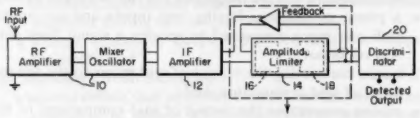
FREQUENCY MODULATION RECEIVER

Elie Joseph Baghdady, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 29, 1957, Ser. No. 649,345
Int. Cl. H04b *1/10*
U.S. Cl. 325—347 **4 Claims**

3. A frequency-modulation receiver comprising a driving amplifier having a pass band at least as great as twice the maximum frequency deviation of the signals to be received, a limiter connected to the output of the driving amplifier, detecting means connected to the limiter output, and a feedback circuit connected between the output and the input of the limiter, said feedback circuit including an amplifier and a

filter, the feedback amplifier being constructed to cause in the absence of a received signal a self-oscillating condition at a single fixed frequency in the pass band of the driving amplifier, and the filter being constructed to substantially limit the condition of in-phase feedback to signals of frequencies within said pass band.

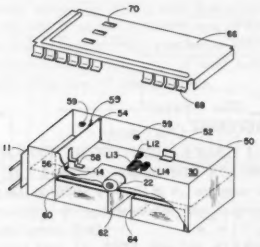


3,909,726

UHF HYBRID TUNER

Pierre Dobrovolny, North Riverside, and Stanley P. Knight, Arlington Heights, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 26, 1973, Ser. No. 400,772
Int. Cl.[2] H04B *1/08, 1/26;* **H01L** *23/16*
U.S. Cl. 325—357 **13 Claims**



1. A UHF tuner comprising a box-like housing having walls of electrically conductive material and including a radio-frequency amplifier tunable to receive selected signals in the UHF spectrum, a local oscillator tunable to develop a mixing signal displaced in frequency from tha tof the selected signal by a constant amount and a mixer responsive to said amplified selected signal and said mixing signal for producing a constant-frequency intermediate signal, said amplifier, said oscillator and said mixer being composed of inductive, capacitive, resistive, connective and active elements, the improvement in said inductive, capacitive, resistive and connective elements comprising:

a substrate, of non-magnetic electrically insulating material, supported with said housinig;

a first layer of electrically conductive material disposed on said substrate in a disconnected pattern defining a plurality of said connective elements;

a second layer of at least one dielectric material overlying said first layer in a disconnected patter;

a third layer of electrically conductive material overlying said second layer in a disconnected pattern defining with said first and second layers said capacitive elements, forming at least a portion of said inductive elements, and defining another plurality of said connective elements;

a fourth layer of at least one resistive material diaposed in a disconnected pattern interconnecting different portions of said first and third layers to complete the definition of said resistive and connective elements;

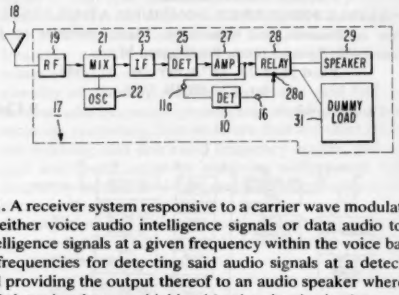
and means mounting said active elements on said substrate in interconnective relationship with said first and third layers.

3,909,727

DATA SIGNALING NOISE SUPPRESSION SYSTEM

Carroll Duane Hughes, McMurray; Walter Charles Painter, Venetia, both of Pa., and Chandos Arthur Rypinski, Tiburon, Calif., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 19, 1974, Ser. No. 462,493
Int. Cl.[2] H04B *1/10;* **H04M** *11/00*
U.S. Cl. 325—478 **4 Claims**



1. A receiver system responsive to a carrier wave modulated by either voice audio intelligence signals or data audio tone intelligence signals at a given frequency within the voice band of frequencies for detecting said audio signals at a detector and providing the output thereof to an audio speaker wherein said data signals cause highly objectional noise in the output of said speaker, the improvement therewith comprising:

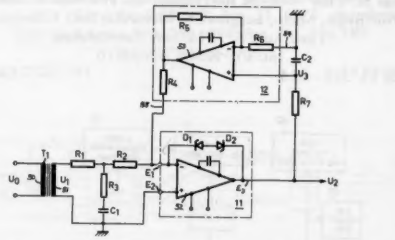
means for normally coupling the output from said detector to said speaker, and timed means including a clipper, a bandpass filter, an AC/DC converter and a timer coupled between said audio detector and said audio speaker responsive to the presence of a tone of said given frequency over a given time period for disconnecting said normally coupling means and thereby muting said speaker only during the presence of said tone.

3,909,728

APPARATUS FOR GENERATING A SYNCHRONIZATION VOLTAGE FOR THE IGNITION PULSE CONTROL OF CONTROLLED RECTIFIER-POWER STAGES

Hans-Jörg Suter, Rueti near Bulach, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Jan. 28, 1974, Ser. No. 437,755
Claims priority, application Sweden, Feb. 16, 1973, 732311
Int. Cl.[2] H03B *35/00*
U.S. Cl. 328—28 **3 Claims**



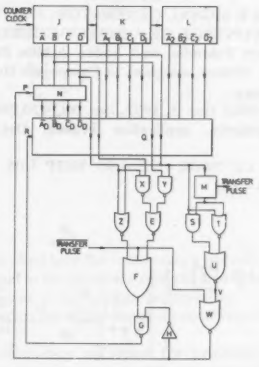
1. An apparatus for generating a synchronization voltage for the ignition pulse control of a controlled rectifier-power stage, comprising supply voltage means for delivering a sinusoidal-shaped alternating-current supply voltage, a comparator circuit having inputs, a T-network electrically connected in circuit between said supply voltage means and said inputs of said comparator circuit, said comparator circuit serving for the transformation of said sinusoidal-shaped alternating-current supply voltage into a square wave alternating-current output voltage of predetermined pulse amplitude and wherein said square wave alternating-current output voltage is in synchronism with said alternating-current supply voltage, said

comparator circuit having an output, a series connected RC-element electrically connected in circuit with said output of said comparator circuit for generating a direct-current voltage average value of the square wave alternating-current output voltage, said series connectd RC-element bringing about a phase-lead of said square wave alternating-current output voltage with respect to the sinusoidal-shaped alternating-current supply voltage, a feedback circuit including a feedback amplifier, said feedback circuit including an input means and an output means for said feedback amplifier, the input means of said feedback amplifier being connected in circuit with the capacitor of said series connected RC-element, the output means of said feedback amplifier being connected in circuit with one input of the comparator circuit, said T-network incorporating components for constituting said T-network a phase-trailing electrical network for compensating the phase-lead of the square wave alternating-current output voltage caused by said series connected RC-element, so that said square wave alternating-current output voltage is both in phase and in synchronism with said supply voltage.

3,909,729
OUTPUT CIRCUITRY FOR DIGITAL INSTRUMENTS

Peter William Fry, Dorchester, England, assignor to Integrated Photomatrix Limited, Dorchester, England

Filed Aug. 19, 1974, Ser. No. 498,445
Claims priority, application United Kingdom, June 14, 1974, 26572/74
Int. Cl.[2] G01R *13/02;* **G11D** *1/00;* **H03K** *21/12*
U.S. Cl. 328—50 **4 Claims**

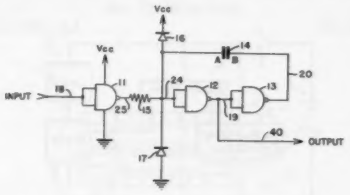


1. Output circuitry for a digital instrument, including:
means providing an output in the form of a binary coded digital number which is periodically updated;
a store to which the binary coded number is transferred in response to a transfer pulse; and
control means operative to prevent the transfer of the least significant digit of the digital number to the store in response to a transfer pulse if such digit represents a transition between oddness and evenness when compared with the corresponding digit of the digital number at the time of the immediately preceding transfer pulse.

3,909,730
PULSE WIDTH DISCRIMINATOR

James T. Odom, Huntsville, Ala., assignor to Avco Corporation, Huntsville, Ala.

Filed July 10, 1974, Ser. No. 487,216
Int. Cl.[2] H03K *5/20*
U.S. Cl. 328—111 **4 Claims**



1. A pulse width discriminator circuit comprising the following, in combination:
a junction,
a point of reference potential representing the condition 0, a source of energy providing a point of charging potential representative of the condition 1,
a positive clamping diode between the 0 reference point and said junction,
a negative clamping diode between the charging potential point and said junction,
a time constant circuit comprising capacitor and resistor elements each having a first end terminal connected to said junction, each element having also a second end terminal,
a gate having an input to which a received pulse to be tested is applied and an output connected to the second end terminal of said resistor, said gate responding to the leading edge transition of said received pulse to switch said gate output and second terminal of said resistor from a 1 to an 0 condition, whereupon said time constant circuit begins to charge up and the voltage at said junction falls, switchable means comprising a pair of inverted gates in series and having an input connected to said junction and a pulse output and an output coupled to the second end terminal of said capacitor, said switchable means normally maintaining a 1 condition on said second end terminal of said capacitor, said switchable means changing state to provide a delayed output pulse of the same polarity as the received pulse in the event that the voltage across said resistor drops to the change of state threshold of said switchable means characterized by a decreasing voltage, so that switching of the switchable means to provide an output pulse occurs only if at least a predetermined time elapses between said leading edge of said received pulse and the reverse transition at the end of said received pulse, an excessively short received pulse being rejected in that said switching does not occur, a pulse of the desired width being accepted in that said switching action does occur and is followed by a response of said gate to the lagging edge of said input pulse, switching said second end terminal of said resistor back to a 1 condition so that said capacitor discharges and the voltage across said resistor increases to the threshold of said switchable means appropriate to switch it back to its original state.

3,909,731
COINCIDENCE TIMER

Slavko Milovancevic, P.O. Box 402, Torrance, Calif. 90508

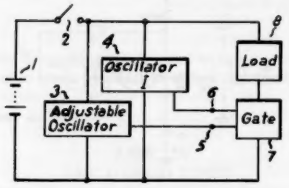
Continuation of Ser. No. 293,395, Sept. 29, 1972, abandoned.
This application Oct. 23, 1973, Ser. No. 397,787
Int. Cl.[2] G01R *29/02;* **H03K** *5/20*
U.S. Cl. 328—129 **7 Claims**

1. A coincidence timer comprising:

means for generating a train of pulses at a first predetermined frequency,

means for generating a train of pulses at a second predetermined frequency having a ratio to said first frequency ranging from 1 (one) to two (2),

coincidence gating means for receiving the pulse outputs of said afore-mentioned means and generating a timing



output signal whenever said afore-mentioned first and second pulses are in coincidence with each other,

whereby said output signal, having period longer than the period of the said afore-mentioned first and second frequencies, is generated at intervals in accordance with the relative frequencies of the two pulse generating means and applied to a load.

3,909,732

ELECTRONIC CONTROL UTILIZING ODD OR EVEN COUNTS

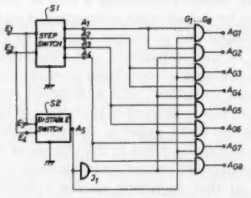
Wolfgang Schröder, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 28, 1974, Ser. No. 473,542

Claims priority, application Germany, May 28, 1973, 2327148

Int. Cl. H03k *17/00*

U.S. Cl. 328—152 **14 Claims**



1. A system for controlling the steps of an electronic control element in response to forward and backward pulse signals, comprising:

electronic step switch means having first and second inputs connected for receiving said forward and backward pulse signals respectively, said electronic step switch means being responsive to said forward and backward pulse signals for providing a stepped signal in increasing and decreasing step directions respectively, said stepped signal steps corresponding to alternate steps of the electronic control element;

electronic switch means responsive to at least one of said forward and backward pulse signals for providing an output signal;

means responsive to said stepped signal from the electronic step switch means and the output signal of the electronic switch means to provide a stepped output signal having steps corresponding to even steps of the electronic control element in one step direction and odd steps in the other step direction.

3,909,733

DYNAMIC RANGE MODIFYING CIRCUITS UTILIZING VARIABLE NEGATIVE RESISTANCE

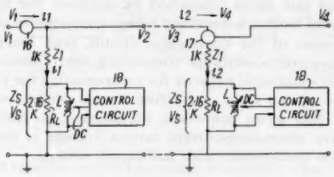
Ray Milton Dolby, London, England, assignor to Dolby Laboratories, Inc., New York, N.Y.

Filed May 14, 1974, Ser. No. 469,837

Claims priority, application United Kingdom, May 17, 1973, 23638/73; Sept. 5, 1973, 41673/73

Int. Cl.² H04B *1/64*

U.S. Cl. 328—165 **40 Claims**



40. In a circuit wherein the dynamic range of a signal is modified within a restricted frequency band by the action of a frequency selective circuit which is responsive to signal components exceeding a selected value within said frequency band to narrow said frequency band to exclude said components from dynamic range modification, the improvement wherein:

said frequency selective circuit comprises a variable equivalent negative resistance whose variation in response to said components effects said narrowing of said frequency band.

3,909,734

REFERENCE SIGNAL GENERATOR, PARTICULARLY FOR THE CONTROL OF A DIRECT-CURRENT MOTOR

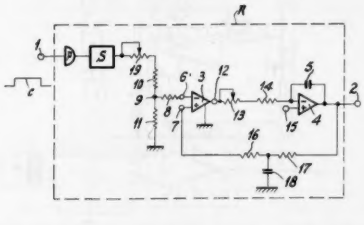
Gaston Albert Palombo, and Andre Achille Brecy, both of Danjoutin, France, assignors to Compagnie Honeywell Bull, Paris, France

Filed Dec. 3, 1973, Ser. No. 420,986

Claims priority, application France, Dec. 21, 1972, 72.45759

Int. Cl.² H03K *4/12, 4/90;* **H02P** *5/06, 7/06*

U.S. Cl. 328—181 **7 Claims**



7. Reference signal generator, particularly for the control of a direct current motor, comprising:

a regulated-voltage source of the pulse-controlled type;

a resistive bridge connected to the output of said regulated-voltage source and comprising a variable element to modify the amplitude of the plateaus of the generator's output signal;

a two-channel transistorized differential amplifier type comparator with one of its inputs connected to the midpoint of said resistive bridge, wherein the emitter-collector paths comprise a constant-current generator, and further comprising two emitter-follower-connected transistorized input stages each associated with one of said channels, with a constant-current generator being mounted in the

emitter-collector path of each of said transistors of said input stages;

an integrator-connected operational amplifier with a shunting capacitor associated therewith;

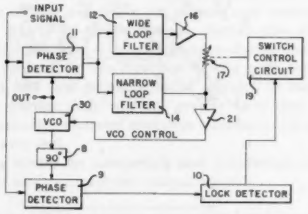
resistive means connecting the output of said comparator with the input of said operational amplifier comprising at least one potentiometer capable of varying the integration constant of the integrator formed by said resistive means and said shunting capacitor; and

means to connect the output of said operational amplifier to the other input of said comparator comprising a filter.

3,909,735
SLOW SWITCH FOR BANDWIDTH CHANGE IN PHASE-OCKED LOOP

Alfred T. Anderson, St. Petersburg; Robert S. Gordy, Largo, and David E. Sanders, St. Petersburg, all of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 4, 1974, Ser. No. 456,694
Int. Cl.[2] H03D *3/18;* **H03B** *3/04*
U.S. Cl. 329—122 **8 Claims**



1. A phase-locked loop for recovering a periodic signal from a received signal in the presence of noise and other undesired signal components comprising in combination:

a phase detector having an input for receiving said received signal;

a variable frequency oscillator for providing a variable frequency signal to an input of said phase detector, the frequency of said variable frequency signal being determined by a control signal;

a narrow loop filter for cutting off signals having a frequency above a first value connecting the output of said phase detector to the input of said variable frequency oscillator at all times;

a wide loop filter for cutting off signals having a frequency above a second value, with said second valve being substantially greater than said first value, said wide loop filter connected to receive the output of said phase detector;

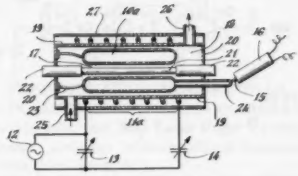
variable impedance means connected between the output of said narrow loop filter and the output of said wide loop filter; and

control means for increasing or decreasing the impedance of said variable impedance means at a controlled rate so as to smoothly shift emphasis of control of the variable frequency oscillator from the wide loop filter to the narrow loop filter for accurate and smooth phase locking.

3,909,736
RF EXCITED ELECTRODELESS GAS ARC LAMP FOR PUMPING LASERS

David A. Huchital, Trumbull, and George N. Steinberg, Westport, both of Conn., assignors to Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 238,563, March 27, 1972, abandoned. This application Feb. 14, 1974, Ser. No. 442,976
Int. Cl. H01s *3/09*
U.S. Cl. 330—4.3 **16 Claims**



1. An inert gas electrodeless arc lamp adapted to produce sufficient light of appropriate wavelength to pump a laser, comprising:

a transparent lamp envelope containing an inert gas from the group consisting of krypton, xenon and argon, the effective width of the lamp envelope being in the range of from about 1 to about 30 mm; the length of the envelope being not more than about 150 mm, and the cold pressure of the gas therein being in the range of from about 0.5 to about 20 atmospheres;

a coil around the envelope for the envelope to be in the flux generated by connecting RF voltage through the coil;

a source of RF voltage connected in a circuit through the coil, said source being adapted to supply sufficient RF power through the coil to maintain a plasma in the gas in the envelope;

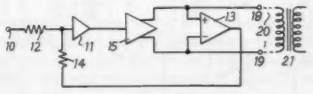
means in said circuit for adjusting the impedance of the circuit first to match the impedance of the cold gas in the envelope and then to match the impedance of a plasma ignited in the gas; and

means for mounting a laser rod adjacent the lamp envelope for light from the envelope to impinge on a laser rod mounted by said means.

3,909,737
FLOATING ELECTRICAL OUTPUT CIRCUIT

Ray Milton Dolby, London, England, assignor to Dolby Laboratories, Inc., New York, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,608
Claims priority, application United Kingdom, Sept. 12, 1972, 42350/72
Int. Cl.[2] H03F *1/08;* **H03G** *3/30*
U.S. Cl. 330—25 **4 Claims**

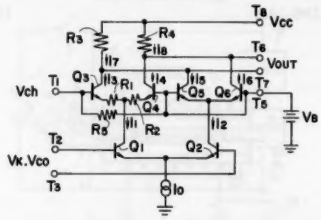


1. A floating electrical output circuit, comprising means for comparing an input signal with a feedback signal to derive a control signal, amplifying means having differential current outputs, means for applying said control signal to drive said amplifying means, a pair of load terminals coupled to said outputs of said amplifying means, and an amplifier circuit coupled across said load terminals to provide said feedback signal directly proportional to the voltage between the load terminals.

3,909,738
AMPLIFIER DEVICE

Masayasu Niimi, Hiroshima, Japan, assignor to Hitachi, Ltd., Japan

Filed July 26, 1973, Ser. No. 382,694
Claims priority, application Japan, July 26, 1972, 47-74181
Int. Cl.[2] H03F *3/68*
U.S. Cl. 330—30 D **10 Claims**

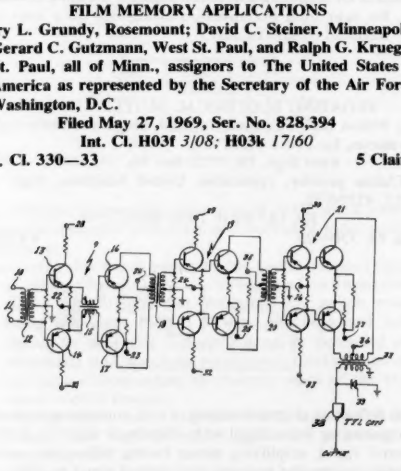


1. An amplifier device comprising a constant current source providing a constant first current, a first differential amplifier means for dividing said constant first current into second and third currents in accordance with a controllable current division ratio, a second differential amplifier means connected to said first differential amplifier means to receive said second current as its constant-current source and having one input supplied with an input signal, a third differential amplifier means connected to said first differential amplifier means to receive said third current as its constant-current source and having two current paths for dividing said third current into respective fourth and fifth currents, one of said two current paths of said third differential amplifier means being connected to one of the outputs of said second differential amplifier means, and the other input of said second differential amplifier means being connected to one of the inputs of said third differential amplifier means, and constant bias means connected to both of said inputs of said third differential amplifier means.

3,909,739
RADIATION HARDENED SENSE AMPLIFIER FOR THIN FILM MEMORY APPLICATIONS

Gary L. Grundy, Rosemount; David C. Steiner, Minneapolis; Gerard C. Gutzmann, West St. Paul, and Ralph G. Krueger, St. Paul, all of Minn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 27, 1969, Ser. No. 828,394
Int. Cl. H03f *3/08;* **H03k** *17/60*
U.S. Cl. 330—33 **5 Claims**

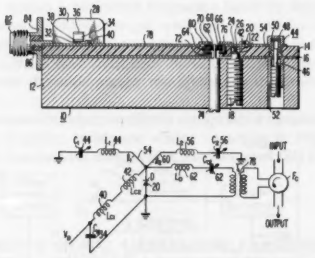


1. A radiation hardened sense apparatus for operation in radiation environments comprising in combination a differential amplifier including two halves and having an input terminal pair and output terminal pair for each half of the differential amplifier, said input terminal pair being connected to an A-C input transformer, said output terminal pair being connected to an A-C output transformer, the primary and the secondary windings of said A-C output transformer being wound on a common core, said primary and secondary windings of each half of said output transformer being in opposite phase to each other for cancelling any photocurrents common to both halves of the differential stage.

3,909,740
LUMPED ELEMENT, BROAD-BAND MICROWAVE APPARATUS USING SEMICONDUCTOR DIODES OPERATING IN THE TRAPATT MODE

Alvin Seymour Clorfeine, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,410
Int. Cl.[2] H03F *3/10*
U.S. Cl. 330—34 **6 Claims**



1. A broad band microwave apparatus of the type including a transmission line, a semiconductor element positioned in said line for generating, in response to a threshold signal, a microwave signal having a plurality of harmonically related frequency signal components, means for applying said threshold signal to said semiconductor element, and output means for transmitting a predetermined harmonic frequency signal component, wherein the improvement comprises:

a plurality of variable impedance lumped element electrical networks, receptive of said microwave signal, each of said networks being respectively associated with a given one of said harmonic frequency signal components of said microwave signal and being respectively tunable substantially independently from the others of said networks over a range of impedance conditions including that of resonance at the frequency of the associated harmonic frequency signal component, each of said networks being formed of an inductance and a variable capacitance connected in series; and

output means, electrically connected to the one of said networks associated with said predetermined harmonic frequency signal component, for transmitting said predetermined signal component to a terminating load impedance;

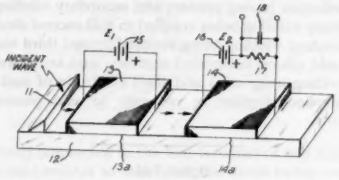
each of the remaining of said networks being connected in parallel across said semiconductor element,

whereby said apparatus provides to said terminating load impedance substantially only said signal component at said predetermined harmonic frequency and substantially confines the remaining of said plurality of signal components by tuning the apparatus at each of said harmonic frequencies in substantial isolation from the others.

3,909,741
ACOUSTIC TRANSDUCER WITH DIRECT CURRENT OUTPUT

Lawrence A. Harris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,568
Int. Cl.² H03F 3/04
U.S. Cl. 330—5.5 15 Claims



1. A transducer for the production of a direct current electrical signal in response to incident acoustic energy; comprising in combination:

a flat rod of piezoelectric material propagative of acoustic surface waves;

means for collecting energy from incident acoustic waves and projecting said energy, as a surface wave of known velocity, along a predetermined path on the surface of said rod;

a first slab of semiconductor material placed proximate the surface of said rod above the path of said surface wave;

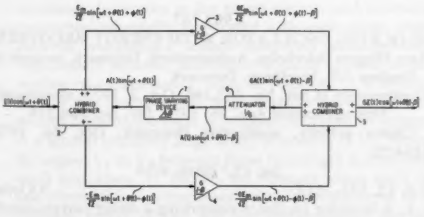
a first source of direct current electric potential connected to said first slab to produce a charge carrier flow within said slab in the direction of said path, the magnitude of said first potential being selected to establish a charge carrier drift velocity greater than said surface wave velocity, whereby energy is transferred to said surface wave; and

extracting means for converting said transferred energy to a direct electrical current output signal.

3,909,742
LINEAR AMPLIFICATION USING NONLINEAR DEVICES AND FEEDBACK

Donald Clyde Cox, New Shrewsbury, and Douglas Otto John Reudink, Sea Girt, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 19, 1974, Ser. No. 498,637
Int. Cl.² H03F 1/36, 3/68
U.S. Cl. 330—84 8 Claims



1. In apparatus for linearly amplifying a bandpass high frequency analog input signal having amplitude variations, plural amplifying means the characteristic of which is nonlinear as contrasted with the requirement for linearity between input and output;

means for producing from the input signal at least two signal components having constant amplitude but differing in phase;

means for applying said component signals for separate amplification in respective ones of said plural nonlinear amplifying means;

means for recombining the amplified components to produce a linearly amplified replica of the input signal, the replica being the difference of the two amplified components;

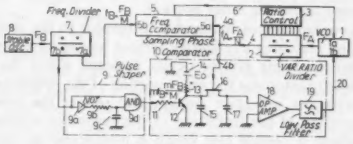
said means for recombining also producing a feedback signal, the feedback signal being the sum of the two amplified components;

and said means for producing a pair of components including means for combining the input and the feedback signal.

3,909,743
FREQUENCY SYNTHESIZER WITH PSEUDO-REFERENCE PHASE COMPARATOR

Jean Pierre Margala, and Jean Louis Roger Cassany, both of Paris, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,603
Int. Cl.² H03B 3/04
U.S. Cl. 331—11 5 Claims



1. A frequency synthesizer comprising:

a controllable frequency oscillator having an output F_A;

a divider by N responsive to said F_A to produce a signal

$$f_A = \frac{FA}{N},$$

as analysis pulses;

a stable source of reference pulses F_B and divider means responsive thereto to divide said F_B by M to produce

$$f_B = \frac{FB}{M},$$

said means also producing shaped pulses

$$mf_B = \frac{m}{M} F_B,$$

a pseudo-reference signal, where m is an integer representing a predetermined phase sampling frequency multiplier;

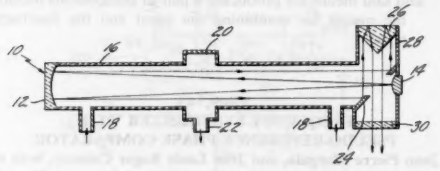
a frequency comparator connected to compare said analysis pulses f_A and said pseudo-reference pulses f_B to produce a first error signal as a function of $|f_B - f_A -$ and for applying said first error signal to said controllable oscillator to modify said frequency F_A up to a point at which $|F_A - Nf_B|\Delta F$, said Δf being a predetermined frequency error signal;

and a sampling phase comparator connected to compare said shaped pseudo-reference pulse signals and said analysis pulses to produce a second error signal as a function of the phase difference of said f_B and f_A pulses, said error signal being also applied to said controllable oscillator in a sense tending to reduce said second error signal to zero.

3,909,744
UNSTABLE RESONATOR SYSTEM PRODUCING A HIGH IRRADIANCE BEAM IN THE FAR FIELD

George R. Wisner, Deep River; Stuart N. Mapes, West Hartford, and Michael L. Skolnick, Trumbull, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 24, 1973, Ser. No. 400,306
Int. Cl.² H03F
U.S. Cl. 331—94.5 C 6 Claims

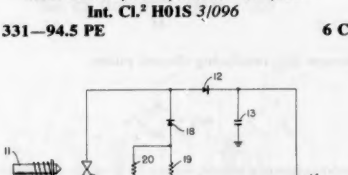


1. A system for the production of an output beam of laser radiation which is highly focusable in the far field comprising:
optical means forming an unstable resonator having an optical axis internal of the resonator and along which a collimated beam of laser radiation is produced by the stimulated emission of radiation in a gain medium disposed in the resonator, the beam comprising an inner portion symmetrically disposed about the optical axis and an outer portion symmetrically disposed about the inner portion;
a coupling mirror inclined with respect to the optical axis and including a reflective surface having an aperture, the mirror being symmetrically disposed about the optical axis to intercept the outer portion of the collimated beam with the reflective surface and reflect the intercepted portion of the beam out of the resonator symmetrically about a central axis which is nonparallel to the optical axis while allowing passage of the inner portion of the beam through the aperture, the near field radiation distribution across the beam reflected out of the resonator having a center void; and
beam collapser means symmetrically disposed about the central axis and in close proximity to the optical axis for decreasing the size of the center void while maintaining the beam collimated.

3,909,745
LASER TRANSMITTER SYSTEM

Richard A. Dye, Santa Barbara, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 17, 1974, Ser. No. 515,810
Int. Cl.² H01S 3/096
U.S. Cl. 331—94.5 PE 6 Claims

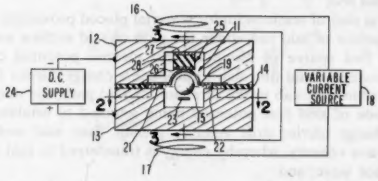


1. A laser transmitter system comprising:
mechanical energy-producing means;
piezoelectric means for providing electrical signals in response to said mechanical energy-producing means;
a first diode coupled between said piezoelectric means and a storage capacitor;
a storage capacitor coupled to said first diode, said capacitor being charged in response to said piezoelectric means;
silicon controlled rectifier having first, second and third electrodes, said first electrode being coupled to said first diode, said silicon controlled rectifier for discharging said capacitor in response to a signal applied to said third electrode of said rectifier;
laser diode means coupled to said second electrode of said silicon controlled rectifier for providing an output signal in response to current being discharged therethrough;
a second diode being coupled between said piezoelectric device and a transformer; and
a transformer having primary and secondary windings, said primary winding being coupled to said second diode, said secondary winding being coupled to said third electrode of said silicon controlled rectifier, said transformer for providing a signal to said third electrode of said silicon controlled rectifier in response to said piezoelectric means.

3,909,746
YIG-TUNED PUSH-PULL MICROWAVE DIODE OSCILLATOR

Wayne G. Abraham, Los Altos Hills, and Robert T. Oyafuso, Mountain View, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed June 17, 1974, Ser. No. 480,065
Int. Cl.² H03B 7/14, 9/12
U.S. Cl. 331—96 15 Claims



1. A microwave oscillator comprising first and second two-terminal negative resistance devices capable of oscillating over a band of microwave frequencies, a tunable high Q filter resonant to frequencies in the band, said filter including a crystal having molecules with magnetic moments precessed at a rate determined by a magnetic field applied thereto, said precession rate determining the filter resonant frequency, first means for coupling microwave energy between said devices and said crystal so that the devices are operated at least approximately in a push-pull configuration, and second means coupled to the crystal for deriving output microwave energy at the filter resonant frequency.

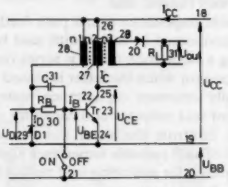
3,909,747
BLOCKING OSCILLATOR WITH ENERGY RECOVERY

Hans Mogens Beierholm, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 403,340, Oct. 3, 1973, abandoned.
This application Aug. 26, 1974, Ser. No. 500,374
Claims priority, application Denmark, Oct. 24, 1972, 5254/72
Int. Cl.² H03K 4/16
U.S. Cl. 331—112 3 Claims

1. A blocking oscillator comprising a direct current supply having first and second terminals, an amplifier constituting a junction transistor having an emitter, collector and base, a feedback transformer connected to said amplifier and having a main winding and an energy-recovery winding, and a diode connected in series with said energy recovery winding in a path in parallel with the first and second terminals of said source, the diode being poled such that when said amplifier is not conducting the magnetic energy stored in said transformer is fed back to the terminals of said source as a current in said

path, said energy-recovery winding being a feedback winding connected to said amplifier, a resistor, said collector being connected through said main winding to the first terminal of said supply, said emitter being connected to the second terminal of said supply, and the ends of said feedback winding being

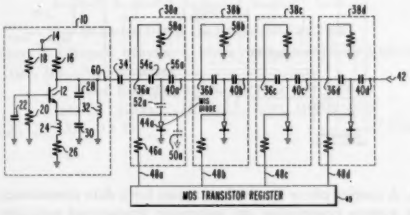


respectively connected to the first terminal of said supply and through said resistor to said base, said diode being connected to the junction of said resistor and said feedback winding, and being poled in the reverse sense to the base-emitter junction of said transistor.

3,909,748
DIGITALLY CONTROLLED OSCILLATOR USING SEMICONDUCTOR CAPACITANCE ELEMENTS

Shui Yuan, Princeton, N.J., and Raymond Louis Camisa, Yorktown Heights, N.Y., assignors to RCA Corporation, New York, N.Y.

Filed May 30, 1974, Ser. No. 474,717
Int. Cl.² H03B *3/04, 5/12*
U.S. Cl. 331—117 R **4 Claims**



1. A circuit for switching the frequency of an oscillator in discrete steps to up to 2^n different values directly in response to n control voltages representing an n digit binary word, where n is an integer greater than 1, comprising in combination:

in the tuned circuit of said oscillator, n networks which continuously remain in the tuned circuit, said networks connected essentially in parallel with each other, each network containing a voltage controlled semiconductor capacitance element, each such element capable of assuming one capacitance value in response to a control voltage in a first relatively large range extending to V_L, a second capacitance value in response to a control voltage in a second relatively large range beginning at V_H, where the region V_L to V_H between these two ranges is relatively small and where V_L and V_H are voltages where each of said elements one capacitance value is proportional to a different power of two and the corresponding second capacitance value is a fixed multiple greater than one times said one capacitance value;

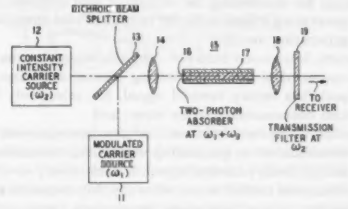
means for applying to each such element a different one of said n control voltages, where each control voltage is at one of two binary levels, one level in said first range and the other level in said second range; and

means for decoupling each network from the remaining networks whereby the application of a control voltage to a particular network will not affect the capacitance of the remaining networks.

3,909,749
OPTICAL TRANSMISSION EMPLOYING MODULATION TRANSFER TO A NEW CARRIER BY TWO-PHOTON ABSORPTION

Heinz Paul Weber, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 12, 1971, Ser. No. 142,680
Int. Cl.² H01S *3/00*
U.S. Cl. 332—7.51 **11 Claims**

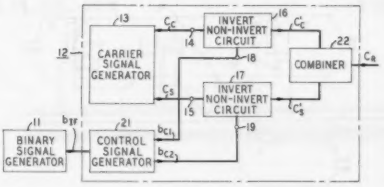


1. In an optical communication system, optical modulation apparatus comprising a source of an intensity modulated optical beam at frequency ω_1, a source of an unmodulated coherent optical beam at a frequency ω_2 not equal to ω_1, means including a body of material having two-photon absorption for respective photons of frequencies ω_1 and ω_2 for generating a photon having a frequency ω_3 which is equal to the sum $\omega_1 + \omega_2$, said body of material having an energy transparency range greater than twice the photon energy of the modulated beam and less than the sum of the photon energies of the modulated and unmodulated beams and having absorption for photons of frequency ω_3, means for directing said beams into said body with coincident intensities sufficient to produce significant two-photon absorption throughout a substantial pathlength in said body, and means for extracting for utilization a resultant intensity modulated beam at frequency ω_2.

3,909,750
APPARATUS FOR ENCODING A BINARY SIGNAL INTO A FREQUENCY MODULATED COHERENT PHASE-SHIFT KEYED SIGNAL

Douglas MacPherson Brady, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 10, 1974, Ser. No. 477,619
Int. Cl.² H04L *27/20*
U.S. Cl. 332—9 R **4 Claims**



1. Apparatus for encoding a binary signal having a pulse period T into a frequency-modulated coherent phase-shift keyed signal, which comprises:

means for generating an amplitude-modulated, cosinusoidal carrier wave of frequency f_0, the signal modulating said carrier wave comprising a cosinusoidal wave of frequency ¼T;

means for generating an amplitude-modulated, sinusoidal carrier wave of frequency f_o, the signal modulating said carrier wave comprising a sinusoidal wave of frequency ¼T;

means, responsive to said binary signal, for generating first and second binary control signals, the logical value of said first binary control signal being changed if, and only if, a change in the logical value of the binary signal to be encoded occurs at the beginning of alternate time slots in said binary signal, the logical value of said second binary control signal being changed if, and only if, a change in the logical value of the binary signal to be encoded occurs at the beginning of the remaining time slots in said binary signal, said first and second binary control signals initially having opposite logical values:

means for combining the output of said cosinusoidal wave generating means with the output of said sinusoidal wave generating means;

means, interposed between said combining means and said cosinusoidal wave generating means and responsive to said first binary control signal, for selectively inverting said cosinusoidal carrier wave; and

means, interposed between said combining means and said sinusoidal wave generating means and responsive to said second binary control signal, for selectively inverting said sinusoidal carrier wave, whereby the output of said combining means comprises the desired phase-shift keyed signal, which signal selectively assumes the frequency (f_o + ¼T) or (f_o − ¼T) depending upon the instantaneous logical value of the binary signal to be encoded.

3,909,751

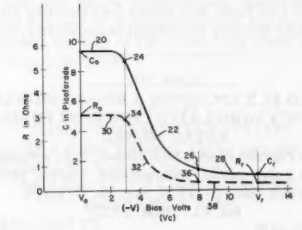
MICROWAVE SWITCH AND SHIFTER INCLUDING A BISTATE CAPACITOR

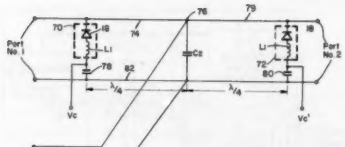
Raymond Tang, Fullerton; Richard W. Burns, Orange, and Russell L. Holden, Fullerton, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 28, 1973, Ser. No. 419,751

Int. Cl.² H01P *1/15, 1/18*

U.S. Cl. 333—7 D **12 Claims**





1. A microwave switching network including, in combination:

a. a pair of conductors for receiving and propagating microwave signals,

b. a variable impedance signal path connected between said conductors and switchable between open circuit and short circuit conditions to either allow microwave signals to bypass said path or be shorted therethrough, said path including

c. a voltage responsive variable capacitance device having two capacitance states for which the device capacitance is substantially invariant in separate predetermined voltage ranges and which is either zero biased or reverse biased in said ranges, and

d. said variable impedance signal path further including an inductor connected in series with said bistate capacitor and having a value such that it is series resonant with said bistate capacitor when the latter is biased to one of its two substantially constant capacitance states, whereby the switching of said inductor and capacitor on and off series resonance controls the short circuit and open circuit conditions of said variable impedance signal path, and the power required for switching said network and the distortion introduced into said microwave signals during switching are minimized.

3,909,752

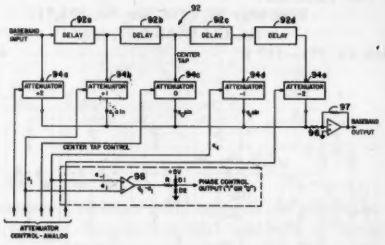
CARRIER PHASE CORRECTION CIRCUIT FOR DATA COMMUNICATIONS SYSTEM

Richard L. Stuart, Beltsville, Md., assignor to Rixon, Inc., Silver Spring, Md.

Division of Ser. No. 172,090, Aug. 16, 1971, Pat. No. 3,813,598. This application Feb. 6, 1974, Ser. No. 440,005

Int. Cl.² H04B *3/04*

U.S. Cl. 333—18 **1 Claim**



1. A carrier phase correction circuit for a data communication system comprising an automatic transversal equalizer, including a center tap and first and second adjacent taps on the opposite sides of said center tap, first and second voltage controlled attenuators respectively connected to the outputs of said first and second taps, means for generating first and second voltage control signals for equalizing the baseband input to the transversal equalizer, said first and second attenuators including input terminals for respectively receiving said first and second voltage control signals, and means for comparing said first and second voltage control signals and producing a first output when the first control signal is greater than the second control signal and a second control signal and a second output when the first control signal is less than the second control signal, said first and second outputs controlling advancing and retarding of the recovered carrier phase.

3,909,753

ACOUSTIC SURFACE WAVE DEVICE

Norman George Burrow, Stockport, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 3, 1974, Ser. No. 475,663

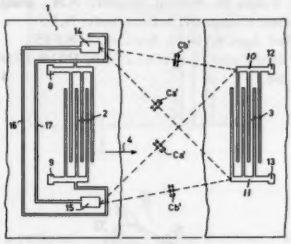
Claims priority, application United Kingdom, June 5, 1973, 26728/73

Int. Cl.² H03H *9/02, 9/26, 9/32;* **H04R** *17/10*

U.S. Cl. 333—72 **5 Claims**

1. An acoustic surface wave device comprising a body of piezoelectric material on one surface of which is arranged a

first and a second transducer for respectively launching and receiving an acoustic surface wave propagated on said surface, in which each transducer includes at least one interdigital electrode array, one of said transducers including two extra electrodes on said surface of the body, each of said extra electrodes being positioned near a respective side of said one transducer in a direction approximately perpendicular to the



surface wave propagation direction but electrically connected to the respective opposite side of said one transducer, so that when both transducers are operated in a push-pull mode each extra electrode is always of opposite polarity to the adjacent side of the one transducer so as to substantially reduce unwanted capacitive signal breakthrough from the launching to the receiving transducer.

3,909,754

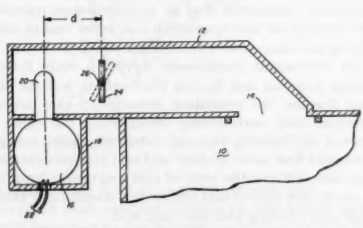
WAVEGUIDE BANDSTOP FILTER

Harry F. Chapell, Maynard, Mass., assignor to Sage Laboratories, Inc., Natick, Mass.

Filed Feb. 26, 1974, Ser. No. 446,030

Int. Cl.² H01P *1/16, 1/22, 7/00;* **H05B** *9/06*

U.S. Cl. 333—73 W **7 Claims**



1. For a microwave oven having means defining an oven cooking cavity, a source of microwave energy at a predetermined frequency and a waveguide for coupling the energy from the source to the cavity, a filter for suppressing a harmonic of the operating microwave frequency comprising a resonant ring and means for supporting the resonant ring within the waveguide and from a wall thereof adjacent the source of microwave energy and having at least a part of the ring extending in the direction of the E vector of the field in the waveguide, said source including a magnetron having a radiating end with said ring disposed an emperically predetermined distance from the radiating end so as to minimize the magnitude of the second harmonic generated by the magnetron.

3,909,755

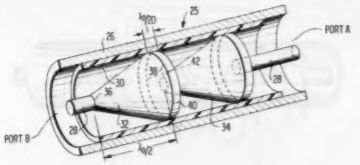
LOW PASS MICROWAVE FILTER

Helmuth M. Kaunzinger, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 18, 1974, Ser. No. 489,869

Int. Cl.² H01P *1/20, 3/06, 3/08*

U.S. Cl. 333—73 C **8 Claims**



1. A low pass microwave transmission line filter having input and output end ports and being unsymmetrical about its ports, for inclusion in a transmission line having first and second continuous guiding surfaces, said filter comprising,

spaced conductive means providing third and fourth guiding surfaces facing toward each other,

the third guiding surface having, at each port of said filter, a configuration to form a continuation of the first guiding surface of the transmission line,

the fourth guiding surface having, at each port of said filter, a configuration to form a continuation of the second guiding surface of the transmission line,

said third guiding surface being geometrically continuous longitudinally throughout the extent of the filter,

the fourth guiding surface including more than one tapered segment, the direction of taper of all segments being the same,

each segment having a transition that is essentially perpendicular to the length of the filter,

whereby said filter is operable in a frequency band having a center frequency corresponding to a wavelength that is substantially twice the length of each tapered segment measured longitudinally of the filter.

3,909,756

WAVEGUIDE SUPPORT SYSTEM COMPRISING A LIQUID-FILLED DUCT

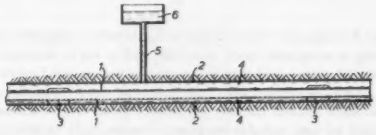
William Kerr Ritchie, Woodbridge, England, assignor to The Post Office, London, England

Filed June 14, 1974, Ser. No. 479,415

Claims priority, application United Kingdom, June 19, 1973, 29005/73

Int. Cl.² H01P *3/13, 1/16*

U.S. Cl. 333—95 R **8 Claims**



1. A waveguide system for long distance signal transmission systems including a waveguide and a duct containing a liquid, wherein the waveguide is substantially supported within the duct by at least partial immersion in the liquid so that the buoyancy provided by the liquid is substantially equal and opposite to the gravitational force on the waveguide, whereby attenuation in the waveguide due to sagging is reduced.

3,909,757

LEAKY COAXIAL CABLE

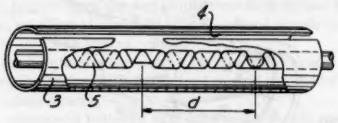
Yoshio Miyamoto, and Toshiyuki Ikemiya, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 6, 1974, Ser. No. 448,680

Claims priority, application Japan, Mar. 13, 1973, 48-29254

Int. Cl.[2] H01P 3/06; H01Q 13/20, 13/22

U.S. Cl. 333—97 R 4 Claims



1. A leaky coaxial cable comprising an inner conductor of at least one helically wound conductor with its winding direction reversed alternately at a predetermined interval approximately equal to one-half of the wave length of the operating frequency, and a coaxial outer conductor having gap means extending along in parallel with the cable axis to leak wave energy propagating in the cable.

3,909,758

SOLENOID VALVE

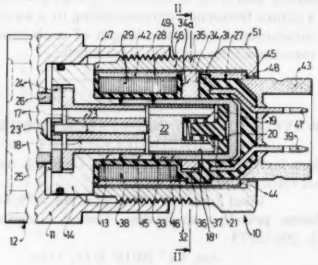
Waldemar Hans; Helmut Staib, both of Bamberg, and Alfred Grob, Oberstenfeld, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 5, 1974, Ser. No. 476,706

Claims priority, application Germany, July 25, 1973, 2337843

Int. Cl.[2] H01F 7/08

U.S. Cl. 335—255 12 Claims



1. A solenoid valve comprising tubular magnetic means having a magnetic core member and a valve member both provided within said tubular magnetic means, said valve member being connected with said magnetic core member; a magnetic shell spaced radially outwardly from and rotatable with respect to said tubular magnetic means, said magnetic shell having an open end portion; solenoid coil means surrounding said tubular means; solenoid terminal means spaced axially from said coil means and having terminals connected to said coil means which are accessible through said open end portion of said shell; and a magnetic plate inserted in said shell and around said tubular means for completing a magnetic circuit induced by said coil means so as to magnetically move said magnetic core member and said valve member, said plate substantially filling the space between said coil means and said terminal means, whereby said rotatable magnetic shell is readily mountable and removable with respect to said tubular magnetic means for facilitating the continued use of unimpaired parts and the replacement of damaged parts.

3,909,759

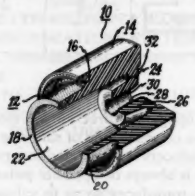
BUSHING WELL FOR INSTRUMENT TRANSFORMER AND TRANSFORMERS INCLUDING SUCH WELL

Ronald J. Ouellette, Derry, N.H.; Robert S. Canney, Berwick, Maine, and Ralph B. Stetson, Exeter, N.H., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,585

Int. Cl.[2] H01F 40/00, 27/04, 27/36; H01B 17/42

U.S. Cl. 336—84 4 Claims



1. A molded bushing well for use with instrument transformers to provide high voltage connections thereto comprising:

a cup shaped body molded of electrical insulating material, said body having a first end portion with an outer surface of one diameter and a second or inner end portion with an outer surface of a larger diameter, said end portions being joined by a groove, said first outer surface having a conductive coating thereon, said cup shaped body having a well therein tapering inwardly from said first end and contoured to receive a termination module, the inner end of said well having an opening for receiving a threaded conductor stud of an instrument transformer, the surface of said opening in said inner end of said well being provided with a conductive coating.

4. An instrument transformer having a body formed of insulating material and having the bushing well of claim 1 molded therein, the insulating material of said instrument transformer body surrounding substantially the entire outer surfaces of said bushing well and completely filling said groove between said first outer surface and said second outer surface locking said well into the body of said instrument transformer, and a conductor stud of said instrument transformer extending through said opening and into said well.

3,909,760

INDUCTIVE TRANSMITTER OF READINGS

Heinz Kraus, Traunreut, Germany, assignor to Firma Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Dec. 6, 1974, Ser. No. 530,451

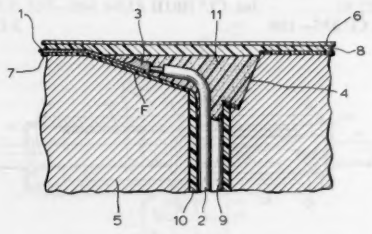
Claims priority, application Germany, Dec. 6, 1973, 2360771

Int. Cl.[2] H01F 21/04

U.S. Cl. 336—84 6 Claims

1. An inductive transmitter of readings for measuring paths and angles comprising two elements movable relatively toward each other and each bearing conductor paths on a sensor member, each of said conductor paths extending into

a recess on each sensor member and soldered, on an inclined surface of said recess, to a connecting wire which extends



through a perforation in said sensor member, insulating means filling the remainder of said recess.

3,909,761

TRANSFORMERS

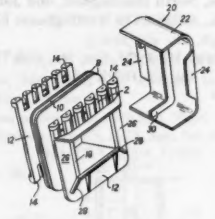
Terence Neville Miles, Leicester, England, assignor to Miles-Platts Limited, Leicester, England

Filed May 21, 1974, Ser. No. 471,980

Claims priority, application United Kingdom, May 23, 1973, 24745/73

Int. Cl.² H01F *15/10, 27/30*

U.S. Cl. 336—192 **6 Claims**



1. A transformer bobbin assembly comprising:

a one-piece body member formed by two axially arranged spool members having an open central portion for receiving a core of metal material and at leasts one radially extending intermediate first flange means dividing said body into two portions, the periphery of said first flange means forming a first interengaging portion, a second flange at each end of said body member defining a winding area between each said second flange and said first flange means,

a shroud means mounted transverse of the axis of the body member enclosing the winding areas of said body member over at least a portion of the peripheries thereof,

said shroud means having a portion projecting inwardly forming a second intereng aging means cooperating with said first interengaging means,

at least one of said interengaging means comprising a multiple lip and the other of said engaging means interleaving with said multiple lip.

3,909,762

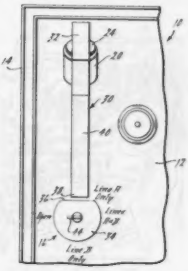
CIRCUIT BREAKER AND FUSE INTERLOCK MECHANISM

Alan L. Wilks; James D. Richerson, and M. Denton Cormany, all of Versailles, Ky., assignors to Kuhlman Corporation, Troy, Mich.

Filed Oct. 31, 1974, Ser. No. 519,686

Int. Cl.² H01H *37/00*

U.S. Cl. 337—4 **10 Claims**



1. In an electrical circuit, a circuit breaker interconnected in the electrical circuit to cut off the supply of energy from one portion of the circuit to another portion of the circuit, a removable overload responsive device interconnected in the another portion of the circuit, the improvement comprising selection means interconnected with the circuit breaker to select, when actuated, an open circuit position and at least one closed circuit position, an overload responsive device holder assembly including a cover assembly for positioning the overload responsive device, said cover assembly including means movable to remove the overload device from the circuit, and interlock means hingedly supported in position over said overload device cover in the closed position and rotatable away from said overload device cover in the open position to permit removal of the overload device in said open position, and means on said selection means to preclude rotation of said interlock means when said selection means is in said at least one closed circuit position.

3,909,763

SELF-RESTORING CURRENT LIMITER

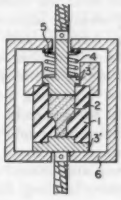
Ko Soeno; Hisashi Ando, and Hiroshi Sakamoto, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 12, 1974, Ser. No. 441,821

Claims priority, application Japan, Feb. 12, 1973, 48-16599

Int. Cl.² H01H *85/06*

U.S. Cl. 337—21 **10 Claims**



1. A self-restoring current limiter comprising a current limiting material, means having a chamber for accommodating said current limiting material, at least a pair of electrodes electrically connected with said current limiting material, and means for absorbing the variations in volume of said current limiting material; said current limiting material including an

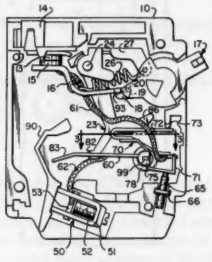
indium alloy material; part of said alloy being in liquid form and having a resistivity of not more than 50 $\mu\Omega$cm at approximately room temperature and a vapor pressure of not less than 760 mmHg at 1500°C.

3,909,764

ELECTRIC CIRCUIT BREAKER

Harold E. Belttary, Rio Piedras, P.R., assignor to Caribe Circuit Breaker Co., Inc., San Juan, P.R.

Filed June 5, 1974, Ser. No. 476,661
Int. Cl.² H01H 71/16
U.S. Cl. 337—75 9 Claims



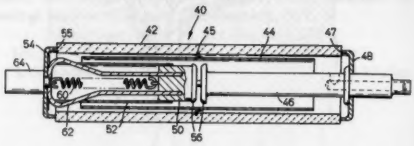
1. A circuit breaker including in combination
a housing of insulating material;
a fixed contact mounted in said housing;
a manually movable handle mounted in said housing;
a contact carrier with a movable contact thereon and pivotally engaging said handle at a pivot point;
a trip arm pivotally mounted in said housing;
an overcenter spring connected between said contact carrier and said trip arm urging said contact carrier against said handle;
said handle, contact carrier, and overcenter spring forming an overcenter arrangement for closing said contacts when the spring is on one side of said pivot point and for opening said contacts when the spring is on the other side of said pivot point;
a load terminal mounted in said housing;
a thermally responsive latching member connected in circuit between said load terminal and said movable contact; a mounting member holding the thermally responsive latching member at a portion thereof adjacent to one end; said mounting member being pivotally mounted in said housing at a pivotal connection;
a support member mounted in said housing and bearing against the mounting member;
said mounting member having a spring portion bearing against the housing and urging the mounting member against said support member whereby said pivotal connection, said support member, and said mounting member in combination hold the portion of the thermally responsive latching member adjacent said one end fixed with respect to the housing, said thermally responsive latching member being rotatable about the pivotal connection against the urging of the spring portion;
said thermally responsive latching member having a latching surface adjacent the opposite end thereof engaging said trip arm and maintaining said trip arm in a set position when said contacts are closed, with said overcenter spring urging said trip arm toward a tripped position;
said thermally responsive latching member bending in response to a predetermined current condition to move said opposite end of the thermally responsive latching member and disengage said latching surface from said trip arm releasing said trip arm for movement to the tripped position;
movement of the trip arm to the tripped position moving the overcenter spring to the other side of said pivot point causing said contacts to open.

3,909,765

FUSED VACUUM INTERRUPTER

Edwin A. Link, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Division of Ser. No. 191,205, Oct. 21, 1971, which is a continuation-in-part of Ser. No. 18,868, March 12, 1970, abandoned. This application Mar. 8, 1974, Ser. No. 449,265
Int. Cl.² H01H 85/04
U.S. Cl. 337—159 3 Claims



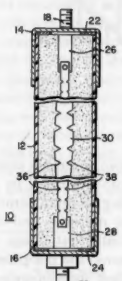
1. A fusible vacuum interrupter for proecting a high voltage electric circuit, said interrupter comprising:
a sealed dielectric housing,
two electrically conductive members supported in closely spaced relation in said housing, one of said members being movable within said housing,
a fusible element having a length of approximately ½ inch bridging the space between said members, said members having contact surfaces having cross sectional areas greater than 5 times the cross sectional area of the fusible element,
and means for biasing said one movable member away from said other member.

3,909,766

CURRENT LIMITING FUSE ELEMENT

Frank L. Cameron, North Huntingdon, and John W. Staney, Penn, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 10, 1974, Ser. No. 468,779
Int. Cl. H01h 85/04
U.S. Cl. 337—159 5 Claims

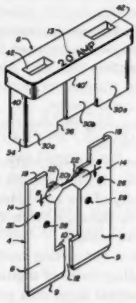


1. A fuse structure comprising a generally tubular, electrically insulating casing, terminal means disposed adjacent to each of the opposite ends of said casing, a fusible element disposed between and connected to said terminal means, the fusible element being an elongated member and having a plurality of spaced pairs of edge notches, one notch of each pair of notches laterally opposite the other notch, and the fusible element being tapered from the center toward each end.

3,909,767
MINIATURE PLUG-IN FUSE

Harold L. Williamson, and Avinash P. Aryamane, both of Mount Prospect, Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

Filed Jan. 14, 1974, Ser. No. 432,980
Int. Cl. H01h *85/08*
U.S. Cl. 337—264 19 Claims

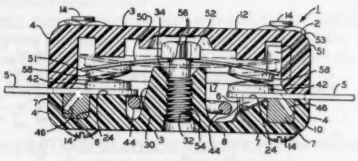


1. A plug-in fuse element comprising a one-piece coplanar plate-like body of fuse metal which body comprises a pair of juxtaposed laterally spaced generally parallel terminal-forming blade portions to be received by pressure clip terminals in a mounting panel, the terminal-forming blade portions having current-carrying extensions at the inner end portions thereof which are interconnected by a transversely extending fuse-forming link portion of much smaller cross-sectional area than said terminal-forming blade portions and the current-carrying extensions thereof, said terminal-forming blade portions, current-carrying extensions at the inner end portions thereof and transversely extending fuse-forming link portion being substantially all in the same plane parallel to the outer faces of the plate-like body forming the same.

3,909,768
TERMINAL MOUNT FOR AN ELECTRICAL DEVICE

Lee O. Woods, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 290,574, Sept. 20, 1972. This application Oct. 23, 1973, Ser. No. 409,011
Int. Cl.[2] H01H *37/04*
U.S. Cl. 337—380 39 Claims

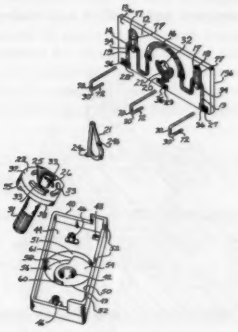


1. A terminal mount for an electrical device having a generally cup-shaped dielectric housing base member having an interior base floor and a wall rising from a peripheral portion of the base floor with the wall having an aperture through which a terminal may extend between the interior and exterior of the electrical device, said terminal mount comprising a step rising from said base floor and extending from said wall adjacent said aperture, said step having a recess in the top surface thereof and a trough communicating from said recess to the periphery of said step whereby a terminal may be extended through the aperture with a planar surface of the terminal overlaying the step and with a terminal tab projecting down into the recess, and the terminal secured to the mount by a thermosetting adhesive disposed within the recess in contact with the terminal tab and with excess thermosetting adhesive flowing from the recess through the trough towards the periphery of the step and the base floors.

3,909,769
VARIABLE VOLTAGE DIVIDER

Arthur L. Rozema, Elkhart, Ind., and Howard G. Alm, Fairbury, Ill., assignors to CTS Corporation, Elkhart, Ind.

Filed Oct. 31, 1973, Ser. No. 411,400
Int. Cl.[2] H01C *10/34*
U.S. Cl. 338—48 10 Claims



1. A variable voltage divider comprising a dielectric substrate, a plurality of conductive terminations, including one relatively high voltage termination, supported on said substrate, resistance means comprising first, second and third resistive paths supported on said substrate, one end of said second resistive path being connected to said first resistive path and the other end of said second resistive path being connected to said high voltage termination, one end of the third resistive path being connected to a second one of the terminations and the other end of the third resistive path being connected to said first resistive path, a collector supported on said substrate, adjusting means supported for movement relative to said substrate, and a conductive contactor constrained to move with said adjusting means and wipably engaging the first resistive path and the collector, said substrate comprising registration means for locating the substrate in a housing, said registration means comprising a first registration means and a second registration means spaced apart from said first registration means, said second resistive path being arcuately disposed about one of said registration means and said third resistive path being arcuately disposed about the other of said registration means.

3,909,770
VARIABLE-SLIDE RESISTOR INCLUDING LIGHT SOURCE HAVING INTENSITY DEPENDENT UPON RESISTOR SETTING

Shunzo Oka, Hirakata, and Kazuo Oshima, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

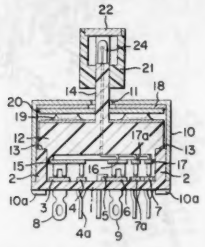
Filed Mar. 11, 1974, Ser. No. 449,614
Int. Cl.[2] H01C *10/38*
U.S. Cl. 338—119 17 Claims

1. A variable resistor comprising
a. a case member with an open bottom and an elongated slot formed at the top thereof;
b. a mount formed from an insulating material and attached to said case member at said open bottom so as to define a hollow case;
c. a first resistor means and a first conductor means on said mount in parallel with each other and to said elongated slot;
d. a second resistor means and at least one second conduc-

tor means on said mount in parallel to each other and to said elongated slot, a terminal connected to the midpoint of said second resistor means, said second conductor means being divided into two sections at a point corresponding to said midpoint of said second resistor means, a second terminal connected to said two sections of said second conductor means;

e. a sliding member formed from an insulating material, disposed within said case, provided with an operating means extending upwardly and outwardly through said elongated slot and slidable along said elongated slot and said mount;

f. a first contactor attached to said sliding member for



slidable contact with said first resistor means and said first conductor means so as to short-circuit between them, and at least one second contactor attached also to said sliding member for slidable contact with said second resistor means and said at least one conductor means so as to short-circuit between them; and

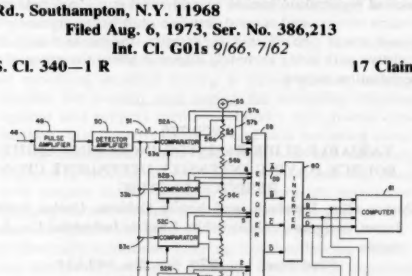
g. at least one light source means attached to said operating means and electrically connected in series to said second resistor means and said at least one conductor means, said light source means comprising two light sources, each of which is interconnected between said contactor in slidable contact with said second resistor means and contactor in slidable contact with each of said two sections of said second conductor means.

3,909,771

OPHTHALMIC B-SCAN APPARATUS

Norman C. Pickering, Ferry Rd., North Haven, Sag Harbor, N.Y. 11963, and Nathaniel R. Bronson, II, 186 Old Town Rd., Southampton, N.Y. 11968

Filed Aug. 6, 1973, Ser. No. 386,213
Int. Cl. G01s *9/66, 7/62*
U.S. Cl. 340—1 R **17 Claims**



1. A B-scan ultrasonocope comprising:

scanning head means having an output portion;

transducer means contained within said scanning head means for providing an acoustic output signal when triggered with and electric input signal and for producing an electric output signal upon receiving an echo pulse input caused by a body reflecting the acoustic signal;

motor drive means for moving said transducer means across said output portionn of said scanning head means;

pulse generator means electrically coupled to said transducer means for providing the electrical input to the transducer means;

display means including vertical deflection control means, horizontal deflection control means, and a plurality of color gun means;

clock means coupled to said scanning means and to said vertical deflection control means for synchronization of the vertical deflection on said display means with the movement of said transducer across said output portion of said scanning head means;

amplifier means receiving the electrical output signal from said transducer means;

detector means converting the output from said amplifier means into a series of input pulses whose amplitude represents the intensity of the echo pulses and whose spacing in time represents distance from the reflecting body to said scanning head means;

conversion means for converting said series of input pulses into a corresponding series of digital signals whose values represent incremental steps of a predetermined continuous functional relationship with said series of input pulses;

encoding means for converting said series of digital signals into binary coded decimal values;

decoding means for converting said binary coded decimal values into a series of signals whose values represent incremental steps of another predetermined continuous functional relationship with said series of input pulses;

means coupling the signals of each of said last mentioned incremental steps to respective ones of said color guns; and

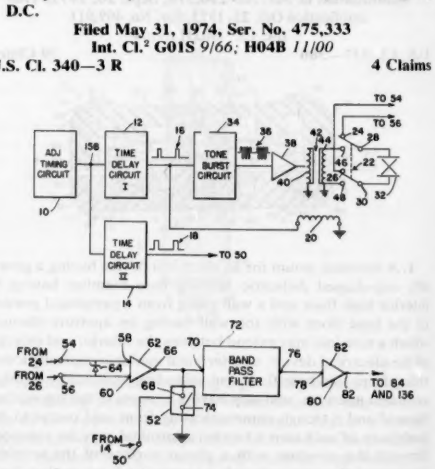
gating means responsive to said clock means for controlling the horizontal deflection control means, whereby horizontal distances on the display means represent distances from said scanning head means.

3,909,772

EXPENDABLE VOLUME REVERBERATION PROFILER

Ralph R. Miller, III, Seattle, Wash., and Donald D. Abraham, Old Lyme, Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 31, 1974, Ser. No. 475,333
Int. Cl.² G01S *9/66;* **H04B** *11/00*
U.S. Cl. 340—3 R **4 Claims**



1. An expendable volume reverberation profiler comprising:

an acoustic transducer:

switching means being connected to said transducer;

a transmitter section being detachably connected to said transducer via said switching means, said transmitter including an adjustable timing circuit for generating electrical pulses at a preselected rate, a first delay circuit for generating a first pulse train from said electrical pulses and a second delay circuit for generating a second pulse train with each pulse thereof having duration longer than that of each of the pulses of said first pulse train;

a receiver section being detachably connected to said transducer via said switching means; and

a power source for providing power to said transmitter and receiving sections, and said switching means.

3,909,773

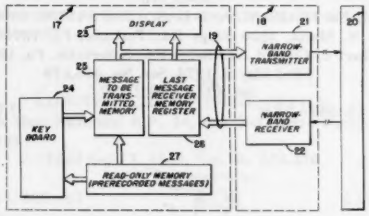
UNDERWATER TELETYPE COMMUNICATION SYSTEM

Benjamin A. Saltzer, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 19, 1974, Ser. No. 480,905

Int. Cl.[2] H04B *11/00*

U.S. Cl. 340—5 R **6 Claims**



1. A swimmer-carried underwater communications system comprising:

a keyboard for selecting predetermined message elements;

first memory register means connected to said keyboard for receipt fo said selected message elements and temporal storage thereof;

display means connected to said first memory register means for visual display of said selected message elements prior to transmission;

transmitter means connected to said first memory register for transmitting said predetermined message elements;

receiver means positioned to receive message elements transmitted to said swimmer-carried underwater communications system; and

second memory register means connected to said receiver means for receipt and temporal storage of the output thereof and connected to said display means for selectively displaying the stored contents thereof.

3,909,774

CONTROLLED BUOYANCY SYSTEM FOR SEISMIC STREAMER SECTIONS

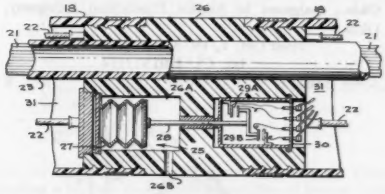
George M. Pavey, Jr., Dallas, Tex., assignor to Whitehall Corporation, Dallas, Tex.

Filed July 25, 1974, Ser. No. 491,931

Int. Cl.[2] B63B *21/00, 21/56*

U.S. Cl. 340—7 PC **6 Claims**

1. An automatic buoyancy controlled streamer section for controlling the depth of adjacent portions of an elongated expansible flexible marine seismic detection streamer having serially connected sections containing a plurality of hydrophones therein and each filled with a buoyancy control liquid of different density from the density of the sea water in which the streamer is to be immersed to be towed continuously at a predetermined depth of submersion through the sea water by a vessel, the streamer section comprising an elongated hollow outer tubular jacket having a pressure sensing switch assembly located within the jacket of the streamer section including a pressure sensing device having a movable wall which has a first surface exposed to a reference pressure and an opposite surface exposed to the water pressure at the depth of the streamer to move in response to changes in water pressure of the sea water at the depth of the streamer section, first and second pairs of electrical contacts in the streamer section forming first and second switches, a first contact of each contact pair being a fixed contact and the second contacts of each contact pair being rigidly interconnected together for corresponding movement along a switch axis and being directly connected to said movable wall of said pressure sensing device to be actuated thereby, said contact pairs being in normally open condition and said first contacts of said contact pairs being spaced in opposite directions from their companion second contacts for electrically closing said first and second contact pairs respectively upon movement of the interconnected second contacts in first and second relatively opposite directions, a buoyancy control liquid supply line extending



through the streamer section from a pressurized source of the buoyancy control liquid, a normally closed electrically operated inlet valve and a normally closed electrically operated exhaust valve disposed within the streamer section for admitting an additional quantity of the buoyancy control liquid from said supply line to the streamer for increasing the buoyancy thereof and for discharging the buoyancy control liquid from the streamer section for decreasing the buoyancy thereof respectively, and electrical circuit connections from an electrical power source through said first and second electrical contact pairs to said inlet valve and exhaust valve respectively by direct connections wholly located within the section between the contact pairs and said valves to operate said inlet valve and exhaust valve respectively responsive to closure of said first or second contact pairs by the movable wall of said pressure sensitive element upon downward or upward deviation respectively of the streamer depth from said predetermined depth.

3,909,775

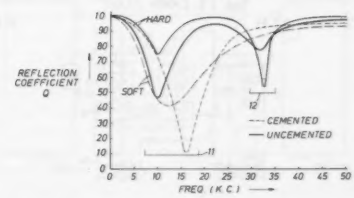
METHODS AND APPARATUS FOR ACOUSTIC LOGGING THROUGH CASING

Jean C. Lavigne, Arlington, Mass., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 323,882, Jan. 15, 1973, abandoned, which is a continuation of Ser. No. 38,984, May 20, 1970, abandoned. This application Oct. 26, 1973, Ser. No. 409,788

Int. Cl.[2] G01V *1/40*

U.S. Cl. 340—15.5 BH **19 Claims**



1. Apparatus for acoustic logging of earth formations located behind a casing bonded to a cement annulus in a well bore comprising:

an elongated body member sized for passage through a well bore;

at least one transmitter, having a center frequency of approximately 10,000 cycles per second, carried by said body member; and

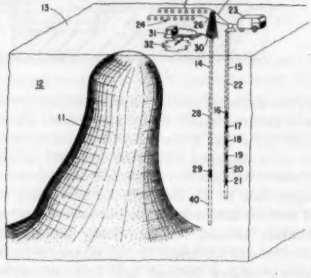
at least one receiving transducer carried by said body member and responsive to energy transmitted by said transmitter, said receiving transducer being spaced vertically from said transmitter at a distance sufficient to attenuate the acoustic energy traveling along the casing upon the arrival thereof at said receiving transducer to a level permitting detection by said receiving transducer of the energy traveling through the formations upon the arrival thereof at said receiving transducer.

3,909,776

FLUIDIC OSCILLATOR SEISMIC SOURCE

Robert A. Broding, and Ralph A. Landrum, Jr., both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed Oct. 1, 1973, Ser. No. 402,441
Int. Cl.[2] G01V *1/14*
U.S. Cl. 340—17 **8 Claims**



1. A seismic source suitable for subsurface use consisting of a fluid-actuated oscillator including a frequency determining fluid circuit comprising an acoustic reactance,

means for supplying said oscillator with a liquid under pressure, and

means within the body of said oscillator for changing said acoustic resistance while said oscillator is oscillating,

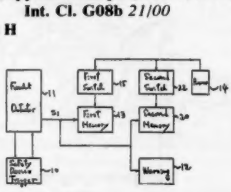
whereby liquid discharged from said oscillator pulsates in pressure at predetermined changing time intervals from peak to peak.

3,909,777

FAULT RECORDER FOR TRIGGER MECHANISM OF MOTOR VEHICLE SAFETY DEVICE

Kosaku Baba, and Akio Hosaka, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 8, 1973, Ser. No. 330,669
Claims priority, application Japan, Feb. 9, 1972, 47-14120
Int. Cl. G08b *21/00*
U.S. Cl. 340—52 H **5 Claims**



1. A fault recorder for use with a vehicle safety device triggering mechanism connected across a power source for triggering a safety device of a vehicle, which provides information of the time lapsed from the beginning of a partial malfunction of the safety device triggering mechanism to an undesired actuation of the safety device and also information of the time from the former to a collision of the vehicle, the fault recorder comprising:

fault detector means connected to said safety device triggering mechanism and adapted to detect partial malfunctioning thereof to generate a signal indicative thereof;

first normally closed condition switch means connected to said safety device triggering mechanism and also to said fault detector means and responsive to actuation of the safety device to reverse switch conditions;

second normally closed condition switch means connected to said power source and responsive to a collision condition of the vehicle to reverse switch conditions;

first memory means connected to the first switch means and adapted to record the time lapsed from the beginning of the signal to the actuation of the safety device; and

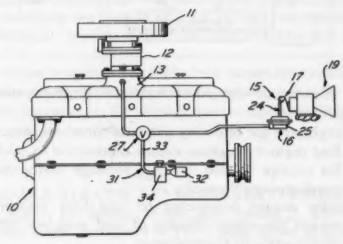
second memory means connected to said second switch means and adapted to record the time lapsed from the beginning of the signal to the collision of the vehicle.

3,909,778

DRIVER TRAINING AND GASOLINE SAVING DEVICE

Paul N. Maria, 1620 Ridge Rd., Perkasie, Pa. 18960, and Albert C. Conard, 123 Ridge Rd., Sellersville, Pa. 18944

Filed May 3, 1974, Ser. No. 466,679
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—52 R **7 Claims**



1. In an internal combustion engine including an inlet manifold connected in fluid communication between a carburetor and combustion chamber, the improvement comprising: vacuum actuable operating means, fluid conduit means having one end connected to said operating means and having its other end adapted for fluid communication with the manifold to actuate said operating means responsive to reduced manifold vacuum, audible alarm means operatively connected to said operating means to be operated by the latter responsive to undesired vacuum loss in the manifold, and valve means interposed in said fluid conduit means for selectively effecting said fluid communication, whereby an operator is signaled by said alarm to minimize or eliminate undersired carburetor control.

3,909,779

VEHICLE GAGE ALERT SYSTEM USING LIGHT EMITTING DIODES

George D. Snyder, Oak Park, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 22, 1974, Ser. No. 453,891
Int. Cl.[2] B60Q *1/00*
U.S. Cl. 340—52 F **7 Claims**

1. A motor vehicle gage alert system comprising:

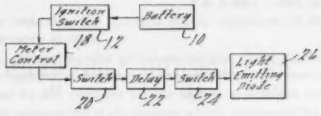
a source of power including a battery,

an ignition switch connected to said source of power,

gage control and condition responsive means operable from said source of power for generating a first signal which

varies continuously in accordance with the condition sensed thereby and operates said gage to provide a display which varies accordingly,

switch means responsive to said first signal when it attains a predetermined level for generating an actuation signal, delay means responsive to and delaying said actuation signal from said switch means;



a switching transistor having its input electrically connected for receiving said delayed signal from said switch means, and

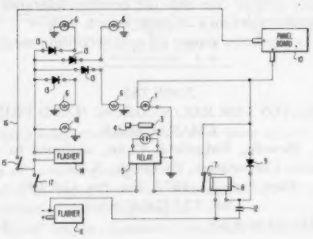
a light emitting diode electrically connected in the output circuit of said switching transistor and energized in accordance with whether said first signal from said gage control means has attained said predetermined level to alert the operator to a sensed motor vehicle condition requiring attention.

3,909,780

LOW-VELOCITY WARNING DEVICE

Bobbie Dale Huffman, R.R. 24, Box 163, Terre Haute, Ind. 46602

Filed Sept. 2, 1969, Ser. No. 854,410
Int. Cl.² B60Q 9/00
U.S. Cl. 340—62 **2 Claims**



1. An automatic warning device for a vehicle equipped with a warning signal means for warning that said vehicle is stopped, or is in reverse motion or is in motion at a velocity below a selected velocity, comprising

a. a rigidly mounted speedometer responsive to said velocity and having a radially-movable pointer having a mask thereon in the same plane as that of said pointer adapted to mask a light source, said pointer projecting an arc as it moves radially responsive to said velocity of said vehicle,

b. a light source pivotably-mounted behind said speedometer and adjustable along an arc generally concentric with said arc projected by said masking pointer and maskable by said masking pointer,

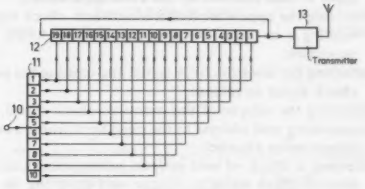
c. a photoelectric cell concentrically and pivotably mounted forward of said speedometer, parallel to and responsive to and activated by said light source, and radially adjustable along said arc, said photoelectric cell being connected with a relay adapted to closing a circuit to and activating said warning signal means when said photoelectric cell is activated by said light source, and opening said circuit when said masking pointer moves in front of said light source at said selected velocity, thereby interrupting light from said light source whereby said photoelectric cell is inactivated, and thereby inactivating said warning signal means.

3,909,781

METHOD OF CODE CONVERSION OF MESSAGES

Thijs Krol, and Nicolaas Alphonsus Maria Verhoeckx, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 26, 1973, Ser. No. 382,898
Claims priority, application Netherlands, Aug. 26, 1972, 7211675
Int. Cl.² H03K 13/24; H04L 3/02
U.S. Cl. 340—347 DD **9 Claims**



1. An arrangement for generating a plurality of signals representing a second code from a plurality of binary coded signals of a first code, said plurality of first code signals comprising *n*-element address words and said plurality of second code signals comprising *m*-element words, said arrangement comprising: a register for the storage of signals representing *n*-elements of an address code word of the first code;

means for determining a series of *m*-element positions, each position adapted for receipt of a signal representing a code word element, and

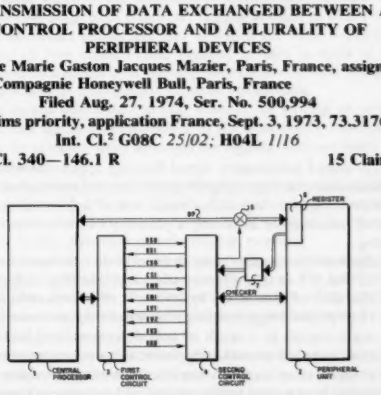
means for transferring each element-representing-signal from the register containing said first code word to two of said *m*-element positions of the series of *m*-element positions so that with a given sequence of the *n*-element positions, the first *n*-element positions of the *m*-element series contain the address code word of the first code in said given sequence and the last *n*-element positions contain the address code word in the reversed sequence.

3,909,782

METHOD AND DEVICE FOR CONTROL OF THE TRANSMISSION OF DATA EXCHANGED BETWEEN A CONTROL PROCESSOR AND A PLURALITY OF PERIPHERAL DEVICES

Claude Marie Gaston Jacques Mazier, Paris, France, assignor to Compagnie Honeywell Bull, Paris, France

Filed Aug. 27, 1974, Ser. No. 500,994
Claims priority, application France, Sept. 3, 1973, 73.31760
Int. Cl.² G08C 25/02; H04L 1/16
U.S. Cl. 340—146.1 R **15 Claims**



1. A method of control of transmission of data exchanged between a central processor and at least one peripheral unit through a transmission channel, said method comprising:

sending a cycle of signals in two sequences, said sequences comprising:

sending a first data transmission demand sequence comprising information relative to the direction of the transmission and the addressing of the data to be transmitted; and

sending a second data transmission sequence; wherein said first data transmission demand sequence comprises:

sending a so-called outwards transfer signal from the central processor to the peripheral unit, said outwards transfer signal fixing the direction of the data exchange;

sending a so-called outwards check signal, while positioning information concerning the addressing of the data at an input to said channel by the central processor;

detecting the appearance of the outwards check signal and sending a so-called inwards check signal to the central processor;

detecting the inwards check signal and causing the outwards check signal to relapse;

detecting the relapse of the outwards check signal;

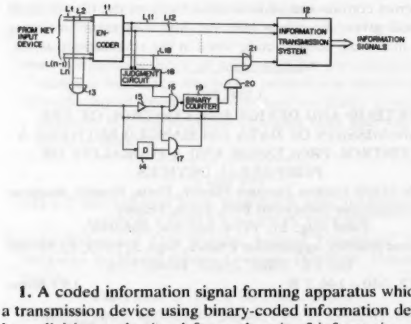
transmitting said address to the peripheral unit through said transmission channel;

effecting a check of said address information; causing the inwards check signal to relapse; and detecting the relapse of the inwards check signal whereby the cycle can recommence.

3,909,783
CODED INFORMATION SIGNAL FORMING APPARATUS

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Higashiyamato, Japan

Filed Apr. 5, 1974, Ser. No. 458,307
Claims priority, application Japan, Apr. 9, 1973, 48-40232
Int. Cl.² H04L 1/10
U.S. Cl. 340—146.1 AG **3 Claims**



1. A coded information signal forming apparatus which, in a transmission device using binary-coded information defined by a division code signal for each unit of information, each unit of information including a plurality of characters, comprising:

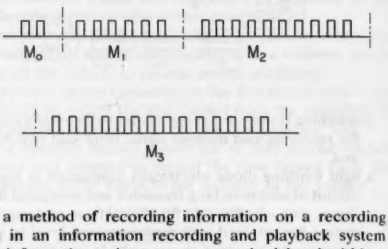
judgement means for determining whether the total number of bits of 1 or 0 of a binary code representing each of said plurality of characters in said unit of information is odd or even and for generating respective odd and even judgement signals as a result of said determination; and

means coupled to said judgement means for inverting the polarity of at least one specified bit of said division code signal in response to one of said odd judgement signal and said even judgement signal obtained from said judgement means, whereby a coded information signal suitable for checking the presence of bit errors in said unit information can be formed.

3,909,784
INFORMATION CODING WITH ERROR TOLERANT CODE

William R. Raymond, West Covina, and Rafn Stefansson, San Marino, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed July 2, 1973, Ser. No. 376,056
Int. Cl.² H03K 13/32; G06K 5/02; G11B 27/36; H04L 1/10
U.S. Cl. 340—146.1 AV **17 Claims**



1. In a method of recording information on a recording medium in an information recording and playback system wherein information pulses are erroneously deleted within a negative tolerance of pulse count of at least one and wherein spurious pulses are picked up within a positive tolerance of pulse count, and wherein said information is expressed in the form of pulses, the improvement comprising the steps of:

arranging said pulses in accordance with the equation and code:

$$M_n = xn + T$$

wherein:

n is the code number;

M is the quantity of pulses per code number;

T is the negative tolerance of pulse count; and

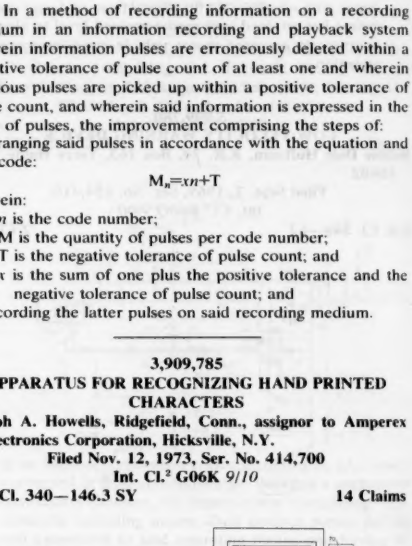
x is the sum of one plus the positive tolerance and the negative tolerance of pulse count; and

recording the latter pulses on said recording medium.

3,909,785
APPARATUS FOR RECOGNIZING HAND PRINTED CHARACTERS

Joseph A. Howells, Ridgefield, Conn., assignor to Amperex Electronics Corporation, Hicksville, N.Y.

Filed Nov. 12, 1973, Ser. No. 414,700
Int. Cl.² G06K 9/10
U.S. Cl. 340—146.3 SY **14 Claims**



1. An apparatus which receives manually formed characters and generates output signals indicative of the characters, comprising:

a data surface having a plurality of defined character regions, each region having a plurality of defined sectors;

means for generating digital signals representative of each of a succession of positional coordinates that are traversed when manually entering characters in said character regions;

sector classifying means responsive to said digital signals for generating a current sector signal which identifies the sector in which the current coordinate is located;

memory means for storing a plurality of memory states each of which is representative of an expected predetermined sequence of sectors which reflect the partial or complete formation of at least one particular character, said memory means generating state signals indicative of one of its states;

means for coupling the current sector signal as an input to said memory means;

means for providing the previous output state signals as a further input to said memory means which is operative in response to the current sector signal and to its previous state for generating state signals which represent its latest;

means for indicating the completion of a manually formed character; and

output means responsive to said completion indication for generating the character-indicative output signals in accordance with the latest state.

3,909,786

DIGITAL TELECOMMUNICATIONS SWITCHING SYSTEMS

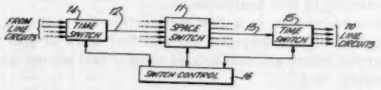
Gerald Norman Lawrence, Coventry, England, assignor to The General Electric Company Limited, London, England

Filed May 28, 1974, Ser. No. 473,449

Claims priority, application United Kingdom, May 29, 1973, 25336/73

Int. Cl.[2] H04M *11/00*

U.S. Cl. 340—147 C **4 Claims**



1. A digital telecommunications switching system comprising:

a series of switching stages,

a plurality of input channels connected to a first stage of said series of switching stages,

a plurality of output channels connected to the last stage of said series of switching stages,

control means connected to each of said switching stages for effecting a communication path through the switching stages,

each switching stage comprising a switching memory containing a plurality of data words, each said data word containing an address determining an outlet from said stage,

each said switching stage further comprising means for reading said data words cyclically, and decoding means for selecting an outlet from the switching stage in dependence upon the address contained in a data word currently being read out,

each data word of a said plurality of data words in one of the stages of said switching memory containing, in addition to said address,

a first data field controlling the operation of said decoding means

and a second data field providing an indication to said control means of whether said associated outlet is free for the establishment of a said communication path thereto,

said control means including

means for writing into a selected said first field data preventing the operation of said decoding means, and consequent completion of a communication path to the associated outlet, and into the associated said second field data representing said associated outlet as busy,

and means for over-writing the data in said first field and consequently enabling said decoding means and the completion of said communication path to said associated outlet.

3,909,787

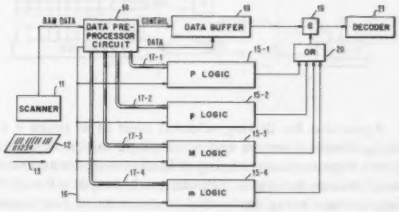
CANDIDATE SELECTION PROCESSOR

George Joseph Laurer, Raleigh, and Eugene Arnold Moore, Cary, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1974, Ser. No. 484,509

Int. Cl.[2] G06K *5/04*

U.S. Cl. 340—146.3 Z **10 Claims**



1. A processor for selecting potentially valid code signals supplied by a coded label scanner which serially scans non-oriented coded labels and provides a continuous multilevel signal having at least two levels corresponding to the coded information on the label, said coded label having a plurality of encoded characters each of which includes a plurality of abutting substantially rectangular bars of differing characteristics, said bars for each of said characters having substantially the same total width in the direction of information content and at least one additional character having at least as many bars as the aforesaid characters and in which the total width of a number of bars equal to the number of bars in each of the aforesaid characters is of substantially different total width in the direction of information content comprising:

first means connected to said scanner for storing an epoch of the signal corresponding to the potentially valid code to be selected from amongst the signals received from the scanner;

second means responsive to the signals from said scanner for forming electric signals, for each of the character phases, which correspond to the total width of the character in the direction of information content;

third means for comparing substantially simultaneously for each of said character phases of the signal, the total width in the direction of information content of successive characters and encoding at least two predetermined relationships;

fourth means for substantially simultaneously examining the encoded relationships and providing output signals whenever the said encoded relationships have a predetermined format; and

fifth means responsive to the output signals provided by said fourth means for gating the then stored epoch of the signal in the first means to a utilization device.

3,909,788

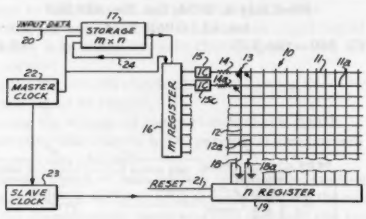
DRIVING CIRCUITS FOR LIGHT EMITTING DIODES

George R. Kaelin, Woodland Hills, and James A. Pellegrino, Thousand Oaks, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 267,238, June 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 184,076, Sept. 27, 1971, Pat. No. 3,740,570. This application Sept. 20, 1973, Ser. No. 399,232The portion of the term of this patent subsequent to June 19, 1990, has been disclaimed.

Int. Cl.[2] H04Q 9/00; H04N 5/38; G08B 23/00

U.S. Cl. 340—166 R 10 Claims



1. Apparatus for driving selected ones of m times n light emitting diodes where m and n are whole numbers, comprising: first register means having at least m outputs and second register means having n outputs, each output of said first register means being connected to one side of one diode in each of n mutually exclusive groups of diodes and each output of said second register means being connected to the other side of one diode in each of m mutually exclusive groups of diodes, each diode being in one of said groups of m diodes and in one of said groups of n diodes; storage means connected to said first register means for storing at least m times n bits representative of information to be displayed, said storage means having a feedback path for recycling m times n bits, first clock circuit means connected to said storage means and to said first register means, said first clock circuit means generating at least m clock pulses for controlling transfer from said storage means of successive binary codes containing at least m bits of data to said first register means for conditioning selected groups of said m groups of diodes for conduction, means for gating said first clock circuit means off for a predetermined period of time after generation of at least m clock pulses, and second clock circuit means driven by and responsive to said first clock circuit means and connected to said second register means, said second clock circuit means generating a single clock pulse substantially equal in duration to the total period of m clock pulses generated by said first clock circuit means for conditioning a group of said n groups of diodes for conduction, diodes existing in both the selected groups of m diodes and the selected group of n diodes being operated for said predetermined period of time, said first and second clock circuit means restarting after said predetermined period of time and recycling said storage means m times n bits to repeat the pattern of operating said diodes.

3,909,789

DATA PROCESSING APPARATUS INCORPORATING A MICROPROGRAMMED MULTIFUNCTIONED SERIAL ARITHMETIC UNIT

Thomas O. Holtey, Newton Lower Falls; Shashi M. Rajpal, Cambridge, and Edward B. Tymann, Natick, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 24, 1972, Ser. No. 309,583

Int. Cl.[2] G06F 7/38

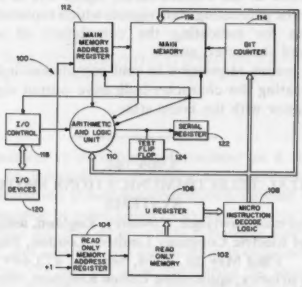
U.S. Cl. 340—172.5 24 Claims

1. Data processing apparatus comprising:

a plurality of first source means, each providing signals representing a different first word having a plurality of operand bits possessing either a first or second binary state;

second source means for providing signals representing a second word having a plurality of operand bits possessing either a first or second binary state;

a memory for storing representations of a plurality of instructions, each of said instructions including a plurality of segments, the representations of one of said segments enabling one of a plurality of subfunctions to be performed;



means for enabling said memory to provide said plurality of instructions; control apparatus comprising:

means responsive to each of said instructions for selectively controlling the transfer of said signals from one of said plurality of first source means,

means responsive to a first subfunction for performing a logical EXOR operation on said first word of said first source means and said second word of said second source means, and

means responsive to said representations in said one segment for altering the operation of performing forming means such that an operation different than EXOR is performed on said first and said said second words.

3,909,790

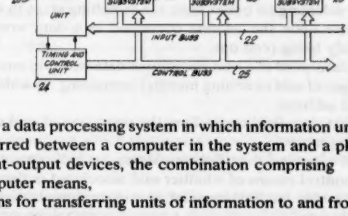
MINICOMPUTER WITH SELECTOR CHANNEL INPUT-UTPUT SYSTEM AND INTERRUPT SYSTEM

Alien L. Shapiro, Santa Ana; Douglas T. Sherwood, Costa Mesa, and Shelton A. Foster, Anaheim, all of Calif., assignors to Omnus Computer Corporation, Santa Ana, Calif.

Filed Aug. 25, 1972, Ser. No. 283,640

Int. Cl.[2] G06F 9/18

U.S. Cl. 340—172.5 19 Claims



1. In a data processing system in which information units are transferred between a computer in the system and a plurality of input-output devices, the combination comprising

computer means,

means for transferring units of information to and from said computer means,

a plurality of input-output devices,

a plurality of controller means, each connected to said transferring means and one of said plurality of input-output devices, each of said controller means comprising

means connected to said transferring means for decoding units of information transferred thereby and generating an enabling signal when an information unit having a predetermined content is decoded,

register means connected to receive said enabling signal and connected to said transferring means for developing a plurality of control outputs, one of said control outputs being turned on in response to an information unit transferred on said transferring means subsequent to said unit having a predetermined content when the register means is enabled by said enabling signal,

a plurality of means for selectively transmitting information units between said means for transferring and the input-output device connected to said controller means, and,

means connecting each of said register control outputs to one of said transmitting means for controlling said means to transmit or not transmit information units.

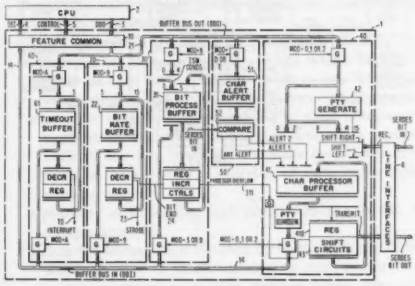
3,909,791
SELECTIVELY SETTABLE FREQUENCY DIVIDER

Jan Wouter van den Berg, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 266,926, June 28, 1972. This application June 21, 1974, Ser. No. 481,928

Int. Cl.[2] H03K *21/02*; **G06F** *3/00*

U.S. Cl. 340—172.5 **4 Claims**



1. A frequency dividing system for reducing a constant frequency scanner input signal by any desired integral divisor, said system comprising:

a storage device having a buffer section and a counter section;

a signal bus;

readout means for said storage device operative during each cycle of said scanner input signal to sequentially first read out to said signal bus the data stored in said counter section and then the data stored in said buffer section; a decrementer receiving the data signals on said signal bus and operating to reduce the data represented thereby a unit value;

a register settable by the output of said decrementer;

register control means operative after the first operation of said readout means to set said register to the decremented value from said coutner section;

an overflow latch in said decrementer to generate a signal if a representation of a zero value is received from said signal bus,

connections from said overflow latch to pass said signal to said register control means to render said register control means also operative after operation of said readout means to set said signal bus in accordance with the data in said buffer section to reset said register to the decremented value from said buffer section;

a counter section control to thereafter set said counter section to the value set in said register;

an input bus settable to a state to represent a divisor value;

gates between said input bus and said buffer section; and

gating controls to set said buffer section to a desired divisor represented by the set state of said input bus.

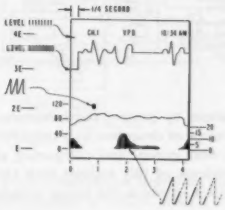
3,909,792
ELECTROCARDIOGRAPHIC REVIEW SYSTEM

George Jerry Harris, Framingham, and Donald DePedro, Millis, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Feb. 26, 1973, Ser. No. 335,631

Int. Cl.[2] G06F *3/00*; **A61B** *5/02*; **G06F** *3/14, 13/00*

U.S. Cl. 340—172.5 **15 Claims**



1. An electrocardiographic review system comprising electronic data storage means having stored therein electrocardiographic trend data for at least one patient taken over an extended time period on the order of hours and sets of time-sequential electrocardiographic waveform data for said patient taken over a plurality of short time intervals each on the order of seconds within said extended time period, said electrocardiographic waveform data being of a type different from said trend data; display means for forming a display; first means for receiving said electrocardiographic trend data from said electronic data storage means and for controlling said display forming means to establish a graphic display of all of said electrocardiographic trend data in the form of a magnitude-time plot so that said electrocardiographic trend data over said extended time period can be visually ascertained; second means for selecting a point along the time axis of said plot and for controlling said display forming means to visually identify said selected point corresponding to a selected short time range on the order of minutes within said extended time period; and third means for receiving said electrocardiographic waveform data from said electronic data storage means and responsive to the operation of said second means for controlling said display forming means to establish a graphic display of one of said sets of electrocardiographic waveform data taken over one of said short time intervals which is referenced by said selected point along the time axis of said electrocardiographic trend data plot.

3,909,793
METHOD AND APPARATUS FOR SEEKING INFORMATION RECORDED ON A MOVING MASS STORAGE UNIT

Marc A. Handrich, Paris, France, assignor to Institut de Programmatique et de Cybernetique, Le Plessis Robinson, France, a part interest

Filed Jan. 3, 1973, Ser. No. 320,738

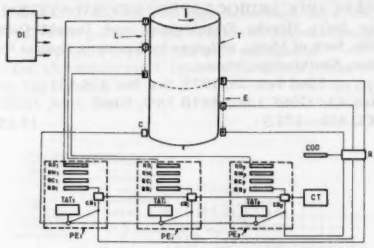
Claims priority, application France, Jan. 5, 1972, 72.00246

Int. Cl.[2] G06F *7/28*

U.S. Cl. 340—172.5 **11 Claims**

1. A method of seeking information images previously recorded on a moving mass storage unit having a number of parallel tracks, wherein said images comprise a predetermined two dimensional bit pattern, said method comprising the steps of examining a multitrack predetermined area of the surface of the storage unit, defining said area by a spatial axis perpen-

dicular to the tracks and a second axis corresponding to the direction of the tracks, said examination of said area including connecting detectors in groups representing all the possible combinations of spatial positions of a series of contiguous spatial positions of said predetemined area, linearizing the



detected bit pattern by passing the information detected by each of these groups of detectors to a respective shift register associated with that group, and comparing at discrete time intervals the contents of this register with the contents of a comparison register in which the image sought exists.

3,909,794

METHOD OF STORING CONTROL DATA UPON THE INTERRUPTION OF A PROGRAM IN A PROCESSING SYSTEM

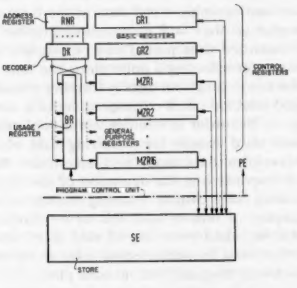
Kay Soltsien, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 15, 1973, Ser. No. 341,572

Claims priority, application Germany, Mar. 23, 1972, 2214240

Int. Cl. G06f 9/18

U.S. Cl. 340—172.5 **5 Claims**



1. In a data processing system having processing units, storage means and program control means, said program control means comprising basic registers and general-purpose registers, a method for retaining the contents of the program control registers when a program being processed is interrupted by a higher priority program, comprising the steps of:

indicating whether each of said general-purpose registers is being utilized for the program being processed by the state of a corresponding stage in a usage register means, said usage register means comprising a plurality of binary stages with each said stage being assigned to a given one of said general-purpose registers,

transferring, upon interruption of the program being processed, the contents of said usage register means, said basic registers and those of said general-purpose registers indicated as being utilized by said usage register means to said storage means and

reading from said storage means, upon resuming the program being processed, prior to interruption with respect to said general-purpose registers, only the contents of those of said general-purpose registers previously utilized.

3,909,795

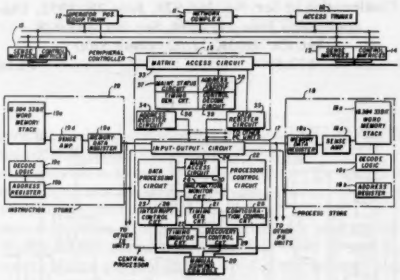
PROGRAM TIMING CIRCUITRY FOR CENTRAL DATA PROCESSOR OF DIGITAL COMMUNICATIONS SYSTEM

Gregory I. Chang, Oak Park; Rolfe E. Buhrke, La Grange Park; Donald L. Schulte, Oak Park, and John A. Wilber, Elk Grove Village, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 31, 1973, Ser. No. 393,542

Int. Cl.[2] G06F 1/04

U.S. Cl. 340—172.5 **11 Claims**



1. A recovery program timer system for a data processing system having a central data processor including processing circuits and maintenance circuits, an interrupt control circuit for generating an interrupt control circuit sequence level signal to start an interrupt cycle, and a recovery control circuit for generating an enable recovery program timing level signal when a recovery program is called, said timer responsive to said enable recovery program timing level signal to initiate a recovery program cycle, said timer comprising:

recovery program register means for accumulating and storing signals representative of a count of machine cycles of said central processor;

incrementing circuit means for incrementing the stored count signals in said recovery program register means each cycle time of said sentral processor, including overflow signal producing means, said interrupt control circuit sequence level signal initializing the incrementing circuit means to zero count;

recovery program timer bistable circuit means responsive to said enable recovery program timing level signal for actuating said recovery program register means; and

logic circuit means responsive to a recovery program punch-in signal and said overflow signal from said incrementing circuitry for generating a recovery program timing error level signal only if said punch-in signal and said overflow signal do not occur at the same time when said recovery program timer is operating in a normal mode.

3,909,796

INFORMATION RETRIEVAL SYSTEM SERIALLY COMPARING SEARCH QUESTION KEY WORDS IN RECIRCULATING REGISTERS WITH DATA ITEMS

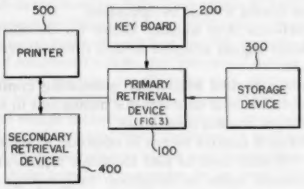
Tetsuo Kitamura, Sagamihara, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Sept. 21, 1973, Ser. No. 399,627

Claims priority, application Japan, Sept. 25, 1972, 47-95942

Int. Cl.² G06F 7/22

U.S. Cl. 340—172.5 **4 Claims**



1. An information retrieval system comprising:

a plurality of recirculating registers for storing a corresponding plurality of key words representing retrieval search questions;

a corresponding plurality of comparators, each corresponding to a register;

a storage device for storing a plurality of data items each comprising at least one key word whose format is the same as that of the search question key words and an associated code identifying an associated document;

means for synchronously applying to each comparator the contents of the corresponding recirculating register and each of the key words of the data items in succession, from at least one of a plurality of data items from said storage device;

a plurality of flip-flops, each corresponding to one of said comparators;

means for setting each flip-flop upon coincidence of the key words applied to its corresponding comparator;

gate output means including register means for receiving the code of the data item whose key words have been compared with the contents of the recirculating registers and responsive to the coincidence of the set state of all flip-flops for gating out the received code; and

means for selectively causing selected flip-flops to be set upon the setting of at least one other selected flip-flop, whereby said code may be gated out of the gate output means upon the coincidence of only one or more of said plurality of search question key words with a corresponding key word of a data item, said code word being available for use in locating an associated document.

3,909,797

DATA PROCESSING SYSTEM UTILIZING CONTROL STORE UNIT AND PUSH DOWN STACK FOR NESTED SUBROUTINES

Gary J. Goss, Acton, Mass.; Richard P. Kelly, Nashua, N.H., and Ming T. Miu, Chelmsford, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 13, 1973, Ser. No. 424,390

Int. Cl.² G06F 9/12

U.S. Cl. 340—172.5 **11 Claims**

1. A method for effecting transfers to and from routines and subroutines comprising the steps of:

generating a first microinstruction from a control store memory which identifies a branch to subroutines, and

executing a branch to a subroutine, said branch executing step including:

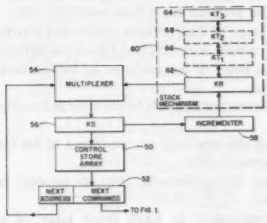
transferring the present executed address in a present address register to an incrementer,

incrementing said present address by a predetermined number,

storing said incremented address which is a return address in a first register of push-down stack,

transferring previous return addresses into adjacent registers in said push-down stack simultaneous with the storing of said incremented address,

transferring the address in said first microinstruction to said present address register;



generating a microinstruction from said control store memory which identifies a return branch from said subroutines, and

executing a return branch from said subroutines, said return executing step including:

transferring the return address from said first register in said push-down stack to said present register,

transferring previous return addresses into said adjacent registers in said push-down stack simultaneous with said transferring said return address to said present address register.

3,909,798

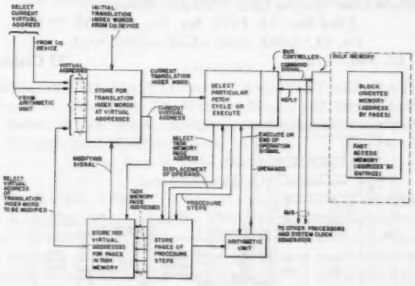
VIRTUAL ADDRESSING METHOD AND APPARATUS

Steven J. Wallach, Chelmsford; Alan J. Deerfield, Newtonville, and Stanley M. Nissen, Reading, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 25, 1974, Ser. No. 436,410

Int. Cl.² G06F 9/20

U.S. Cl. 340—172.5 **3 Claims**


SELECT CURRENT VIRTUAL ADDRESS
INITIAL TRANSLATION INDEX WORD FROM I/O DEVICE
FROM I/O DEVICE
VIRTUAL ADDRESS
FROM ARITHMETIC UNIT
STORE FOR TRANSLATION INDEX WORDS AT VIRTUAL ADDRESSES
CURRENT TRANSLATION INDEX WORD
CURRENT VIRTUAL ADDRESS
SELECT PARTICULAR FETCH CYCLE OR EXECUTE
BUS CONTROLLER
BULK MEMORY
HOLD
BLOCK ORIENTED MEMORY (ADDRESS BY PAGES)
FAST ACCESS MEMORY (ADDRESS BY ENTRIES)
MODIFYING SIGNAL
SELECT VIRTUAL ADDRESS TRANSLATION INDEX WORD TO BE MODIFIED
SELECT MEMORY PAGE ADDRESS
EXECUTE OR END OF OPERATION SIGNAL
OPERANDS
TASK MEMORY PAGE ADDRESS
PROCEDURE STEPS
STORE PAGE OF PROCEDURE STEPS
ARITHMETIC UNIT
TO OTHER PROCESSORS AND SYSTEM CLOCK GENERATION

1. In a digital computer system including memory devices forming a bulk memory and a local memory, wherein locations in any one of a plurality of memory devices making up a said bulk memory may be virtually addressed to provide, on demand during execution of any selected one of a plurality of programs, instructions and operands from different ones of such memory devices for application to, respectively, said local memory and an arithmetic unit included within a processor, the improvement comprising:

a. means for storing a set of logical statements as contiguous translation index words on an integral number of pages in

one portion of the local memory, each one of such logical statements containing, at least:

i. a bulk memory location code field;

ii. a local memory page address field;

iii. a page or operand code field; and

iv. a present or not present code field;

b. means, respsonsive to the contents of the code and address fields in each one of the logical statements as such statements are read, for addressing the bulk memory with, alternatively:

i. a fetch operand command word containing, at least, a bulk memory address defining the location of an operand to be fetched from bulk memory; or

ii. a fetch page of instructions command word containing, at least, a bulk memory page address defining the location of a page of instructions to be fetched from bulk memory;

c. means, responsive to each fetch operand command word, for:

i. receiving the operand commanded to be fetched from bulk memory; and

ii. enabling the arithmetic unit to process the fetched operand;

d. means, responsive to each fetch page of instructions command word, for

i. receiving the page of instruction commands to be fetched from bulk memory;

ii. means, further responsive to each fetch page of instructions command word, for overlaying such page of instructions on a selected page in local memory;

iii. means, further responsive to each fetch page of instructions command word, for entering a present code in the p"present or not present" code field of the current logical statement; and

iv. means, further responsive to each fetch page of instructions command word, for enabling the arithmetic unit to be operated in accordance with successive ones of the fetched instructions.

3,909,799

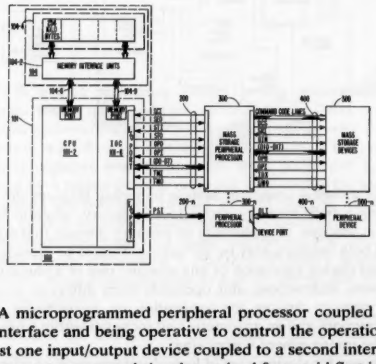
MICROPROGRAMMABLE PERIPHERAL PROCESSING SYSTEM

John A. Recks, Chelmsford; Frank V. Cassarino, Jr., Weston; Edward F. Getson, Jr., Lynn; Karl F. Laubscher, Cambridge, all of Mass.; Albert T. McLaughlin, Hudson, N.H., and Edwin J. Pinheiro, Edina, Minn., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 18, 1973, Ser. No. 425,760

Int. Cl.[2] G06F *3/00, 15/20, 13/00, 9/16*

U.S. Cl. 340—172.5 **33 Claims**



1. A microprogrammed peripheral processor coupled to a first interface and being operative to control the operation of at least one input/output device coupled to a second interface in response to command signals received from said first interface and for transferring information signals between said first and second interfaces involving said input/output device, said peripheral processor comprising:

microprogram control means, said control means including;

storage means having a plurality of storage locations for storing a plurality of microinstruction sequences, each having a plurality of microinstruction, branch control means including a plurality of input terminals coupled to receive a plurality of signals to be tested and coupled to said storage means for conditioning said storage means to branch to different ones of said sequences in accordance with said signals and decoding means coupled to said storage means for generating control signals in response to said microinstructions read out from said storage means during a cycle of operation;

bidirectional data transfer means for transferring information signals coupled to said first and second interfaces;

sequence control means for generating control signals coupled to said data transfer means and to said microprogram control means and,

said branch control means in response to signals applied to different ones of said terminals representative of a command code to condition said storage means to branch to one of said sequences, said decoding means being operative to generate control signals in response to decoding microinstructions of said one sequence for application to said sequence control means, said sequence control means being conditioned by said signals to generate said signals for controlling the subsequent transfer of information signals through said data transfer means at a rate independent of the operating rate of said microprogram control means.

3,909,800

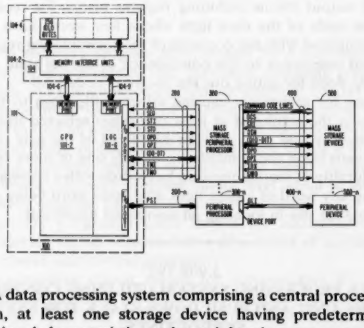
MICROPROGRAMMED PERIPHERAL PROCESSING SYSTEM

John A. Recks, Chelmsford, Mass., and Edwin J. Pinheiro, Edina, Minn., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 18, 1973, Ser. No. 425,769

Int. Cl.[2] G06F *3/00, 15/20, 13/00, 9/16*

U.S. Cl. 340—172.5 **28 Claims**



1. A data processing system comprising a central processing system, at least one storage device having predetermined operational characteristics and a peripheral processor coupled to said central processing system and to said device, said peripheral processor including hardware facilities for transferring data between said central processing system and said device in response to different types of commands specified by command bytes received from said central processing system, said processor further comprising:

an addressable control memory means having a plurality of memory storage locations, at least one group of said plurality of memory storage locations for storing microinstructions of a first type of routine for directing said processor in performing control operations related to one type of said commands, said one group of said locations

of said first routine storing at least one microinstruction containing a coded control byte in a predetermined one of said first group of locations and a second group of said plurality of memory storage locations storing microinstructions of a second type of routine for conditioning said processor hardware facilities for executing only those operations dependent upon said specific operational characteristics of said one peripheral device for transferring data;

register storage means operatively coupled to said memory means for storing at least a control byte of information and signals representative of said command byte; and,

branch control means coupled to said memory means, said branch control means being responsive to said command byte signals to cause said memory means to branch to said microinstructions of said first routine including said one type of microinstruction, said processor during execution of said first routine conditioning said storage means to store a bit representation of said control byte, said branch control means including circuit means responsive to control type microinstructions included in said second routine of microinstructions to test said control byte to determine those transfer operations to be performed by said hardware facilities for the successful execution of said one type of command.

3,909,801

PROGRAM CONTROL DEVICE

Yasufumi Tokura, Kairya; Kazuo Matsuno, Gifu, and Itaru Sakurai, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Japan

Filed Feb. 27, 1974, Ser. No. 446,407

Claims priority, application Japan, Feb. 28, 1973, 48-24595

Int. Cl. G06f *15/46;* **B25j** *9/00*

U.S. Cl. 340—172.5 **9 Claims**

1. A program control device for controlling a plurality of power units of a controlled object having operation member means in accordance with program information comprising:

memory means for memorizing said program information in predetermined memory addresses therein, said program information consisting of step information and point information;

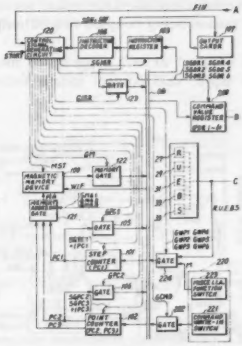
step counter means for instructing a memory address of the step information to said memory means, said step information including a memory address command to instruct a memory address of the point information and a control command to control functions of said program control device;

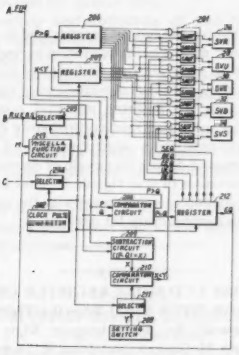
point counter means for instructing a memory address of the point information to said memory means in accordance with said memory address command;

control signal generating circuit means for generating control signals in accordance with said control command;

gate means for selectively connecting said step counter means and said point counter means to said memory means in response to said control signals; and

control means for controlling said power units in accordance with the point informations which have been read





out from said memory addresses instructed by said point counter means.

3,909,802

DIAGNOSTIC MAINTENANCE AND TEST APPARATUS

Frank V. Cassarino, Jr., Weston, Mass., and Edwin J. Pinheiro, Edina, Minn., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 8, 1974, Ser. No. 458,921

Int. Cl.[2] G06F *11/04*

U.S. Cl. 340—172.5 **39 Claims**

1. A diagnostic system for a microprogrammed processing unit including an unalterable addressable control store having a plurality of storage locations for storing microinstruction words, an address register means coupled to said control store for referencing said storage locations, output register means coupled to said control store for storing temporarily microinstruction words read out from referenced locations during cycles of operation and decoder means coupled to said output register for decoding said microinstruction word contents to generate signals to control the operations of said processing unit, said diagnostic system comprising:

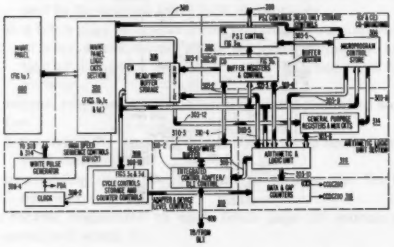
a first plurality of switching means for generating address signals designating a storage location of said control store whose contents are to be substituted;

comparator means coupled to receive said address signals from said first plurality of switches and being coupled to

receive signals from said address register means, said comparator means being operative upon detecting a true comparison between said address signals to generate an output signal;

a second plurality of switching means for generating a substitute microinstruction bit pattern, said second plurality of switching means being coupled to said output register means; and,

control means coupled to said comparator means and to said control store, said control means including logic



means coupled to said output register and to said control store, said logic means being operative in response to said output signal to generate first and second signals respectively for loading signals representative of said substitute microinstruction bit pattern into said output register means and for inhibiting said control store from reading out the microinstruction word contents of the storage location addressed during that cycle of operation thereby enabling generation of said signals for said controlling of said processing unit in accordance with the coding of said substitute microinstruction bit pattern.

3,909,803

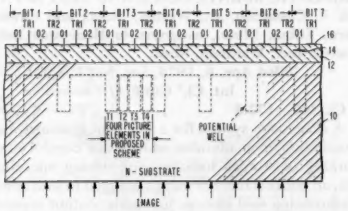
MULTI-PHASE CCD SHIFT REGISTER OPTICAL SENSOR WITH HIGH RESOLUTION

Walter F. Bankowski, Jr., Poughkeepsie; Vijay R. Kumar, Fishkill; William McGovern, and John D. Tartamella, both of Poughkeepsie, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 2, 1972, Ser. No. 303,163

Int. Cl.[2] G11C *11/42, 19/28, 11/40*

U.S. Cl. 340—173 LS **3 Claims**



1. In an optical sensor using a CCD serial shift register having closely spaced gates that cannot be simultaneously employed to optically sense data, an improved method of operation comprising:

sensing under selected gates of the shift register;

reading out of the shift register and storing the data sensed by the selected gates as a serial string of signals;

thereafter sensing under gates of the same shift register that are too closely spaced to the selected gates to sense simultaneously with the selected gates; and

reading out of the shift register and intermixing the data sensed by said too closely spaced gates with the previously stored data by alternating data bits sensed under the selected bits with data bits sensed under the too closely spaced bits in a coherent serial string of data bits.

3,909,804

METHOD OF DRIVING A MATRIX PANEL WITH ONLY TWO TYPES OF PULSES

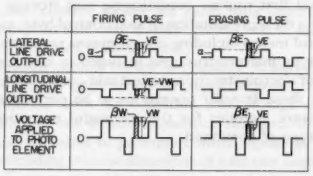
Tetsunori Kaji, Kokubunji, and Masashi Mizushima, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 22, 1974, Ser. No. 444,743

Claims priority, application Japan, Feb. 26, 1973, 48-22066

Int. Cl.[2] G11C *7/00, 11/28*

U.S. Cl. 340—173 PL **10 Claims**



1. A method for the line sequential driving of a matrix panel composed of a plurality of first and second electrodes intersecting one another, and a plurality of photo elements having an information storing function connected to the individual intersections of said first and second electrodes, comprising the steps of:

a. applying a first pulse to each of addressed ones of said first electrodes, said application of said first pulse maintaining each of the photoelements addressed by said first electrode applied with said first pulse in the state before being addressed; and

b. applying a second pulse to one of said second electrodes in synchronims with said application of said first pulse, said synchronous application of said first and second pulses placing a photo element connected to said first and second electrodes respectively applied with said first and second pulses in the fired state, the application of said second pulse alone placing a photo element connected to said second electrode applied with said second pulse in the erased state.

3,909,805

PROGRAMMABLE READ ONLY MEMORY

Serge Auguste Touron, Bagnolet; Jean-Claude Duval, Le Perreux, and Francis Mottini, Eaubonne, all of France, assignors to Compagnie Honeywell Bull, Paris, France

Filed Apr. 30, 1974, Ser. No. 465,638

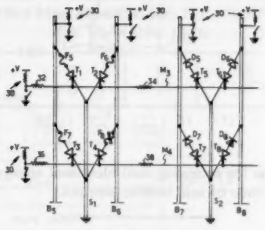
Claims priority, application France, May 4, 1973, 73.16101

Int. Cl.[2] G11C *17/00*

U.S. Cl. 340—173 SP **16 Claims**

1. A programmable read-only memory of the type which is produced in integrated circuit form from a semiconductor substrate and of which the matrix network, comprising word lines and bit columns which make up the said matrix, is formed by straight mutually parallel, resistive semiconductor bands of a type having specific conductive characteristics which are formed in the said substrate, and by mutually parallel wires which are good conductors which are applied to the substrate via an insulating layer and which intersect the said bands at intersections which possess destructible memory elements which connect a band to a wire, characterized in that it includes means for programming it, said means comprising shunt paths which are good conductors and which are intended to channel the programming current away from at least one of the said bands, the paths being connected to the bands

by semiconductor structures the conductive state of which can be controlled by applying a difference of potential between



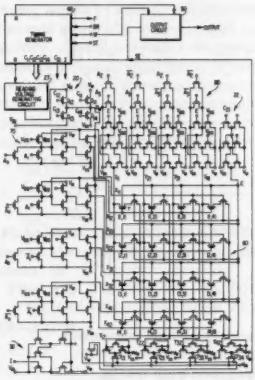
the wire and band to which the memory element to be destroyed corresponds.

3,909,806

ANALOGUE MEMORY DEVICE

Yukimasa Uchida, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed July 15, 1974, Ser. No. 488,776
Claims priority, application Japan, July 13, 1973, 48-78479
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **11 Claims**



6. An analogue memory device comprising:

a nonvolatile insulated gate field effect memory transistor having a source, a drain and an insulated gate;

a first insulated gate field effect transistor having a source, a drain and an insulated gate;

a second insulated gate field effect transistor having a source, a drain and an insulated gate;

means connecting the source of the first insulated gate field effect transistor to the gate of the memory transistor;

means for applying a writing pulse to the drain of the first insulated gate field effect transistor;

means for applying an input analogue information pulse to be memorized to the source of the second insulated gate field effect transistor;

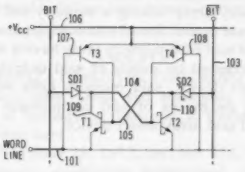
means connecting the drain of the second insulated gate field effect transistor to the gate of memory transistor and a detecting circuit connected to the source of the memory transistor for detecting whether the memorized analogue information pulse in the memory transistor is as large in value as the input analogue information pulse.

3,909,807

INTEGRATED CIRCUIT MEMORY CELL

Alan William Fulton, Batavia, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 3, 1974, Ser. No. 502,675
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 FF **6 Claims**



1. A memory cell for an integrated circuit memory comprising:

a flip-flop comprising first and second directly cross-coupled memory transistors each having a base, a collector, and an emitter;

first and second bit output lines;

means coupling said collectors of said first and second memory transistors with said first and second bit output lines respectively;

first and second current source transistors each comprising a base, a collector and an emitter, the emitters of said current source transistors connected one to the other and arranged to be connected to a source of potential, the collectors of said first and second current source transistors connected respectively to said bases of said first and second memory transistors; and

a word line connected to the emitters of said first and second memory transistors and to the bases of said current source transistors.

3,909,808

MINIMUM PITCH MOSFET DECODER CIRCUIT CONFIGURATION

William Hugh Cochran, Dover; Dale Arthur Heuer, Stewartville, and Michael James Sheehan, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,748
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **8 Claims**

1. A MOSFET decoder circuit configuration for enhancing ROS memory densities for obtaining decoded output lines on a narrower pitch than conventional decoder circuits, wherein said decoded output lines of said conventional decoder are increased by a binary factor of 2^1 comprising in combination:

an external system clock control for generating adecoder clock pulse and an array flush pulse;

a conventional decoder circuit driven by a plurality of decoder address inputs ($A_{n-1} \ldots A_{n-n}$) and said decoder clock pulse to obtain a valid decoding address on a single output line of said conventional decoder;

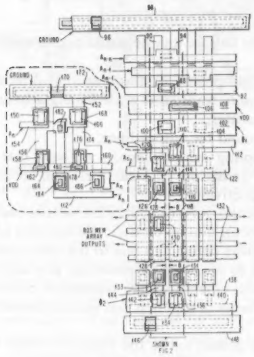
a complement array select device connected to said single output line of said conventional decoder;

an array select device connected to said single output line of said conventional decoder;

an address complement generator driven by a generator address input (A_n) to obtain a generator address output (A_n) at the output of said address complement generator for driving said complement array select device to switch said complement array select device when said valid decoded address is present at said single output line of said conventional decoder thereby obtaining the complement of said valid decoded address at the output line of said complement array select device;

an address generator driven by said generator address output (A_n) of said address complement generator to obtain a generator address output (A_n) at the output of said address generator for driving said array select device to switch said array select device when said valid decoded address is present at said single output line of said conventional decoder thereby obtaining said valid decoded address at the output line of said array select device;

a ROS memory array having a memory cell accessed by means of said output line of said complement array select device, and said ROS memory array having another memory cell accessed by means of said output line of said array select device, said memory cells being selected alternately be means of said complement array select device and said array select device;



a complement array flush device connected to said output line of said complement array select device for flushing the parasitic capacitance from said output line of said complement array select device readying said output line for a subsequent memory access, said complement array flush device being switched by said array flush pulse from said external system clock control;

an array flush device connected to said output line of said array select device for flushing the parasitic capacitance from said output line of said array select device readying said output line for a subsequent memory access, said array flush device being switched by said array flush pulse from said external system clock control;

whereby said single output line of said conventional decoder is increased by a binary factor of 2^1 allowing a narrower pitch to be achieved so as to match said output lines of said complement array select device and said array select device to said ROS memory array input lines.

3,909,809

MAGNETIC BUBBLE DOMAIN SENSING DEVICE

Witold Kinsner, Hamilton, and Edward Della Torre, Toronto, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 17, 1973, Ser. No. 425,696

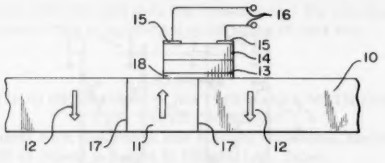
Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **11 Claims**

2. A device for sensing magnetic bubble-domains in bubble supporting material comprising:

first means for converting the magnetic energy in a magnetic field caused by the presence of a bubble-domain in said bubble supporting material, to mechanical energy;

second means coupled to said first means for converting said mechanical energy to electrical energy; and



third means for receiving said electrical energy to indicate the presence of said bubble-domain.

3,909,810

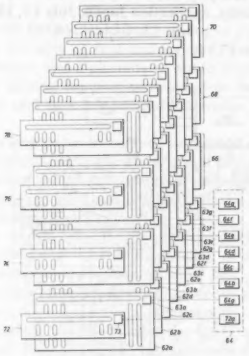
BUBBLE MEMORY MINOR LOOP REDUNDANCY SCHEME

Rex A. Naden, Richardson, and Forrest G. West, Jr., Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 25, 1974, Ser. No. 445,694

Int. Cl.² G11C *11/14, 19/08*

U.S. Cl. 340—174 ED **9 Claims**



1. A bubble memory system, comprising

a data chip including

a major propagation path means,

a plurality of minor loops, at least one of which is faulty,

transfer means for each minor loop for transferring information bubbles to and from said minor loops and said major path means;

a flag chip including

a flag major bubble propagation path means,

a plurality of flag minor loops, and

transfer means for each flag minor loop for transferring bubbles to and from said flag minor loops and said flag major path means

rotating in-plane magnetic field means for propagating bubbles along said major path means for said data chip and said flag chip and said flag chip and around said loops;

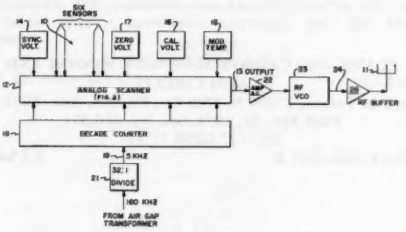
means for effecting bubble transfer through said transfer means; and

detector means connected to said flag major path means for the serial detection of bubbles thereon, a detection of a bubble on said flag major path means corresponding to a flag minor loop emanating said bubble indicating a fault in the data chip minor loop corresponding to said flag minor loop.

3,909,811
MULTIPLEXED TELEMETERING SYSTEM FOR A PLURALITY OF SIGNAL SOURCES

Alan J. Adler, Palo Alto, Calif., assignor to Acurex Corporation, Mountain View, Calif.

Filed May 17, 1974, Ser. No. 470,978
Int. Cl.² G08C *15/06*
U.S. Cl. 340—189 **3 Claims**

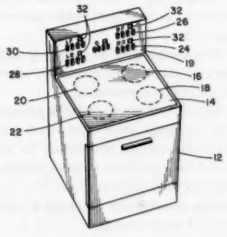


1. A multiplexed wireless data coupling system for telemetering a plurality of signal sources on a single communications channel comprising: means for sequentially scanning at a predetermined rate said signal sources and generating an amplitude modulated ac signal having sequential amplitudes related to the signals produced by said signal sources and an ac frequency determined by said scanning rate; ac amplifier means; voltage controlled oscillator means directly connected to said scanning means by said ac amplifier means and directly responsive to said amplitude modulated ac signal for generating a frequency modulated radio frequency output signal whose amount of frequency deviation is proportional to the amplitudes of said modulation signal and whose rate of deviation is related to said predetermined scanning rate; antenna means for transmitting said radio frequency output signal; and receiver means for decoding said frequency modulated output signal.

3,909,812
FLASHING INDICATOR APPARATUS

Walter Satorius, Minooka, Ill., assignor to Jemco Engineering Co., Minooka, Ill.

Filed Aug. 28, 1974, Ser. No. 501,239
Int. Cl.² H05B *3/68;* **G08B** *21/00*
U.S. Cl. 340—227 R **11 Claims**

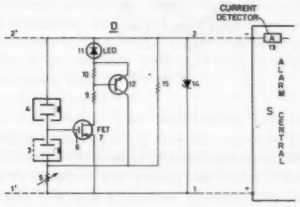


1. A flashing indicator apparatus for indicating a predetermined condition comprising, in combination:
a power supply;
indicator light means visible to an operator;
second light means having a predetermined firing potential, said second light means being operable in a first state whenever the voltage across said second light means exceeds said predetermined firing potential;
means for sensing said predetermined condition and connecting said indicator light means to said power supply whenever said predetermined condition exists; and
transistor means having an operable state for electrically shorting said indicator light means, said transistor means being interconnected with and responsive to said light means, said transistor means being in said operable state whenever said second light means is in said first state, whereby said indicator light means intermittently flashes.

3,909,813
IONIZATION-TYPE FIRE SENSOR

Andreas Scheidweiler, Stafa, and Hanspeter Thalmann, Urdorf, both of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Filed June 28, 1973, Ser. No. 374,310
Claims priority, application Switzerland, July 17, 1972, 10655/72
Int. Cl. G08b *17/12*
U.S. Cl. 340—237 S **20 Claims**



1. Ionization-type fire sensor comprising
an ion chamber (3) accessible to atmosphere subject to fire aerosols, smoke or the like, said ion chamber having electrical resistance which, upon detection of fire aerosols or smoke therein changes in resistance value,
wherein the improvement comprises
two threshold detectors of different threshold levels,
a first threshold detector (7) connected to the ion chamber (3) sensitive to a first resistance condition of the chamber and having a first threshold level to provide a first warning output signal when the resistance value of the ion chamber changes and passes a first threshold level; and
a second threshold detector (9, 10, 12) connected to the ion chamber sensitive to a second resistance condition, higher than the first condition, and having a second threshold level, higher than the first, to provide a second alarm output signal when the resistance value of the ion chamber passes a second level, higher than said first level; and wherein said second alarm output signal provided by said second threshold detector differs in characteristic from said first warning output signal.

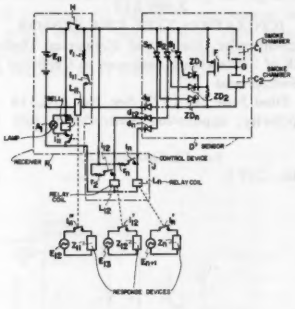
3,909,814
DETECTING AND CONTROL METHOD AND APPARATUS

Yoshihiro Eguchi, Hino, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed July 11, 1973, Ser. No. 378,347
Claims priority, application Japan, July 14, 1972, 47-69964
Int. Cl.² G08B *21/00*
U.S. Cl. 340—237 S **11 Claims**

1. Apparatus for detecting changes in physical phenomena such as changes in smoke concentration and the like and for controlling response devices in accordance with said detected changes, comprising a sensor, said sensor including an ionization means operable to convert a change in smoke concentration into an electrical signal, said ionization means including a pair of chambers one of which is more susceptible to receiv-

ing smoke from the surrounding atmosphere than said other chamber, operable means within said sensor defining a plurality of actuating points each responsive respectively to progressively increasing stages of change of said physical phenomena, said operable means including connecting means for connecting said chambers in series and applying a voltage source thereacross and amplification means between said chambers responsive to the change in resistance in said chambers caused by differences in smoke concentration in said chambers, a



plurality of response devices corresponding respectively to each of said actuating points, said plurality of response devices being operable to provide appropriate response effects dependent on the progressively increasing stages of change of said physical phenomena, and actuating means activated by each of said plurality of actuating points for controlling the operation of said response devices corresponding to each of said actuating points, whereby particular response devices are progressively operable in appropriate response to progressively increasing stages of change of said physical phenomena.

3,909,815

DETECTOR FOR FUMES AND COMBUSTION GASES

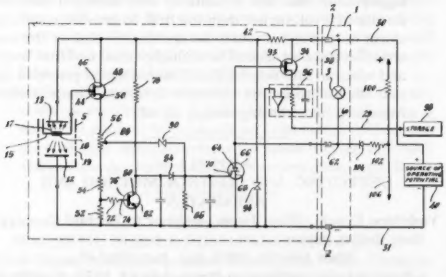
Jean-Marie Gacogne, Paris, France, assignor to Societe Gamma Electronic, Paris, France

Filed Jan. 16, 1974, Ser. No. 433,621

Claims priority, application France, June 4, 1973, 73.20110

Int. Cl.² G08B *21/00, 17/10*

U.S. Cl. 340—237 S **13 Claims**



1. An ionization detector for detecting fumes, vapors or aerosols comprising:

a reference ionization chamber and a sensing ionization chamber positioned within a housing;

a radioactive means arranged for causing the ionization of particles within said chambers;

means for providing a flow path for atmospheric fumes, vapors or aerosols from an environment within which the detector is located to said sensing chamber;

means for providing an electrical output signal from said chambers indicative of the presence of a fume, vapor or aerosol in said sensing chamber; and

circuit storage means coupled to said latter means and means responsive to said electrical signal for providing an indication of the elapsed time between the initial occurrences of the fumes, vapors or aerosols in the sensing chamber and a subsequent instant of time.

3,909,816

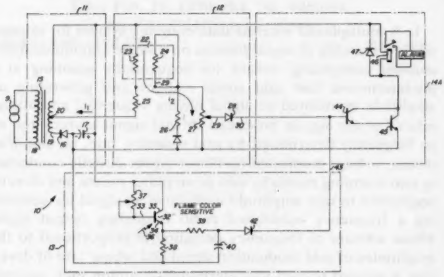
FLAME AND CARBON MONOXIDE SENSOR AND ALARM CIRCUIT

Lloyd L. Teeters, 17834 N. 18th Dr., Phoenix, Ariz. 85023

Filed Apr. 29, 1974, Ser. No. 465,371

Int. Cl.² G08B *17/10*

U.S. Cl. 340—237 R **5 Claims**



1. A gas burner monitor comprising in combination:

a source of electrical energy having a pair of terminals,

a carbon monoxide detection circuit,

a flame color sensing circuit,

an alarm circuit,

said carbon monoxide detection circuit comprising a gas detection element connected to said source of electrical energy and producing a first output signal when said detection circuit senses abnormal amounts of carbon monoxide around it,

said gas detection element comprising a resistance means which changes its electrical resistance when subjected to the presence of carbon monoxide,

said color sensing circuit comprising a phototransistor having an anode, cathode and base, said base being connected through a variable resistance to one terminal of said source and said cathode being connected directly to said one terminal of said source,

said emitter being connected through a resistance to the other terminal of said source,

whereby exposure of said photo-transistor to a predetermined level of light reduces the resistance of the phototransistor between said anode and said cathode to change the base to emitter current flow thereby producing a second output signal,

said variable resistance biasing said phototransistor to render it sensitive to a desired light detection level,

an alarm activating circuit, and

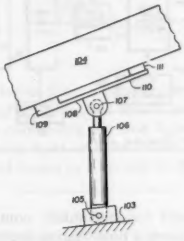
means for connecting said first and second output signals to said alarm activating circuit to actuate an alarm.

3,909,817
OVERLOAD SAFETY DEVICE FOR TELESCOPIC CRANES

Ludwig Pietzsch, Richard-Wagner-Str. 5, 7500 Karlsruhe; Gerd Hühne, Rosselsbrunnle Str. 6, 7501 Morsch; Knud Overlach, Bismarckstrasse 11, 7500 Karlsruhe, and Peter Fuchs, Tulpenstrasse 13 a, 7501 Bruchhausen, all of Germany

Continuation-in-part of Ser. No. 79,589, Oct. 9, 1970, abandoned. This application Apr. 23, 1973, Ser. No. 353,716
Claims priority, application Germany, Jan. 29, 1970, 2004041

Int. Cl. G08b *21/00*
U.S. Cl. 340—267 C **5 Claims**

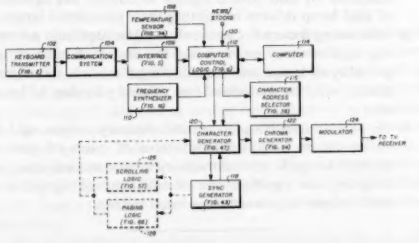


1. Overload safety device for jib cranes comprising transmitter means for registering a working radius and transmitter means for registering a load applied to the jib wherein the crane comprises an upper carriage member, a base jib member, and a luffing cylinder interconnecting said upper carriage member and said base jib member, said transmitter means for registering a load comprising a force measuring cell connected in a force path from said upper carriage member through said luffing cylinder to said base jib member.

3,909,818
MULTIPLE CHANNEL ALPHANUMERIC RESIDENTIAL TELEVISION VIDEO SIGNAL GENERATOR

James A. Dalke, Bellevue, and Wayne E. Hough, Seattle, both of Wash., assignors to MetroData Corporation, Seattle, Wash.

Filed Sept. 14, 1973, Ser. No. 397,288
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 AD **29 Claims**



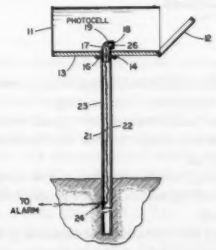
1. A multiple channel alphanumeric residential television video signal generator for receiving information from a variety of sources, such as keyboard, newsline, weather service and stockline sources, and creating video signals suitable for creating a plurality of channel related alphanumeric displays on residential television receivers, each alphanumeric display being dedicated to information related to a particular subject matter, such as weather, sports, general news, local news, stocks, etc., said multiple channel alphanumeric residential television video signal generator comprising:

1. a digital computer suitable for receiving information related to a variety of subjects, manipulating that information and, in accordance therewith, generating a variety of control instructions;
2. computer control logic connected to said digital computer, said computer control logic comprising:
   a. at least one dial-up port adapted to receive keyboard generated information from a keyboard source, and dialup port control instructions from said computer, and apply said received keyboard information to said computer in accordance with said dial-up port control instructions;
   b. at least one newsline interface adapted to receive newsline information, such as news information, weather information, and stock information from a newsline source, and newsline control instructions from said computer, and apply said received newsline information to said computer in accordance with said newsline control instructions;
   c. output displal logic for receiving character generation instructions and output display logic instructions from said computer, and apply said character generation instructions to a multiple channel character generation means in accordance with said output display logic instructions; and,
   d. select logic means for:
      i. receiving select logic instructions from said computer;
      ii. selecting one of said at least one dial-up port, said at least one newsline interface, and said output display logic; and,
      iii. controlling the application of said keyboard generated information, said newsline information and said character generation instructions to one of said computer and said multiple channel character generation means in accordance with said selection; and
3. multiple channel character generation means connected to said control logic means for receiving said character generation instructions and for creating, in accordance therewith, a plurality of video signals, one video signal related to one of a plurality of channels, said video signals being suitable for forming an alphanumeric display dedicated to a particular subject matter on the screen of residential television receivers adapted to receive said video signals.

3,909,819
MAILBOX ALARM

Leslie M. Radford, 6024 N. Grandview Dr., Indianapolis, Ind. 46208

Filed Apr. 22, 1974, Ser. No. 462,721
Int. Cl.² G08B *21/00*
U.S. Cl. 340—281 **10 Claims**

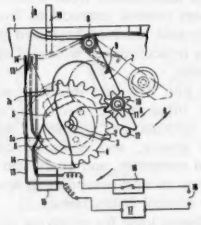


1. Mailbox alarm apparatus comprising: an enclosed mailbox having an openable door; and photosensitive means for initiating activation of an alarm signal in response to light coming from outside the mailbox when the door is opened.

3,909,820
REPEATING ALARM DEVICE

Rintaro Nishina, Yonezawa, Japan, assignor to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Feb. 14, 1974, Ser. No. 442,647
Int. Cl.² G08B *1/00*
U.S. Cl. 340—309.1 **3 Claims**

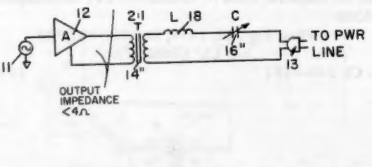


1. A repeating alarm device comprising a first gear secured to a mation transmission shaft, a second gear rotatably mounted on said shaft, said second gear being provided with a contact operating cam and a heart shaped cam secured to one side of said second gear, a pivotably mounted lever, a pinion carried by said lever for engaging said first and second gears, cooperating electric contacts arranged to be closed by said contact operating cam when said second gear is rotated, electric alarm means connected in series with said contacts, and operating means for rotating said lever to disengage said pinion from said first and second gears and to rotate said heart shaped cam and said second gear to a predetermined position.

3,909,821
COMMUNICATING OVER POWER LINES

Neil H. Jagoda, Framingham; Klaus Kubierschky, North Reading, and Howard S. Baker, Brockton, all of Mass., assignors to General Public Utilities Corporation, New York, N.Y.

Filed Oct. 4, 1973, Ser. No. 403,512
Int. Cl.² H04M *11/04*
U.S. Cl. 340—310 R **7 Claims**



1. Apparatus for communicating over power lines carrying power at power frequency comprising,

a source of an audiofrequency signal within a predetermined frequency range within the frequency range of 1 kHz to 20 kHz,

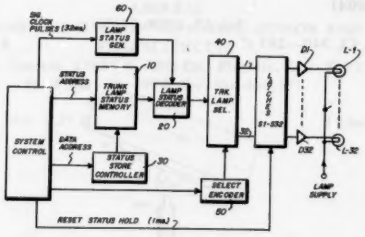
power amplifying means having a low output impedance coupled to said signal source for amplifying said audiofrequency signal,

output terminal pair means for connection to a power line, and means for coupling said output terminal pair means to said amplifying means, said means for coupling having an output impedance presented to said output terminal pair means within the range of 0.1 to 4 ohms within said predetermined frequency range and a much higher impedance at said power frequency.

3,909,822
ARRANGEMENT FOR CONTROLLING A PLURALITY OF LAMPS

David Q. Lee, Chicago, and Dinesh K. Srivastava, Westmont, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 28, 1974, Ser. No. 438,154
Int. Cl.² G08B *5/36*
U.S. Cl. 340—324 R **6 Claims**



1. An arrangement for individually controlling each of a plurality of lamps using a time sharing technique comprising, in combination:

a. a plurality of lamps, each having a lamp driver associated with it for lighting it;

b. memory means for storing the status of each of said plurality of lamps;

c. status generating means for providing a plurality of control signals, each corresponding to a different mode of operation of said lamps, said status generating means driven by clock pulses from a single source and deriving a plurality of different ones of said control signals from said clock pulses, said status genreating means comprising a ground potential source for providing a steady bright control signal, a positive potential source for providing a steady dark control signal, said clock pulses being used to provide a steady dim control signal and being coupled to counter means operable to provide on one output thereof a first control signal and on another output thereof a second control signal, and gating means having said first and second control signals coupled to it for providing a wink control signal to turn on said lamps for a said period of time and to turn them off for a shorter set period of time;

d. latch means coupled to each of said control drivers and operated by said contro signals to control the operation of said lamp drivers in lighting their associated lamps;

e. addressing means for cyclically and sequentially addressing said memory to read out the status of each of said plurality of lamps and for selecting the latch means associated with the addressed one of said plurality of lamps; and

f. decoder means coupled to said memory means, said decoder means decoding the status of each of said addressed lamps from said memory means and selecting and coupling the signified one of said control signals to its latch means to operate said latch means.

3,909,823
OPTICAL FIBER VARIABLE DISPLAY SYSTEM UTILIZING A SINGLE LIGHT SOURCE

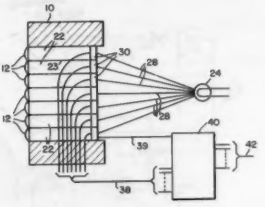
Keith L. Knowlton, Mill Lane Rd., Brimfield, Mass. 01010

Filed Mar. 26, 1974, Ser. No. 456,275
Int. Cl.² G09F *9/32;* **G02F** *1/18*
U.S. Cl. 340—336 **15 Claims**

1. A variable display comprising a group of lenses facing in a common direction,

a single light source, optical fiber light transmitting means adapted to concurrently illuminate each lens in said group of lenses from said single light source,

a light shutter for each lens providing means for selectively illuminating or darkening each lens, so that selected light



transmitting lenses form a lighted display against a dark background of light-blocked lenses, and

selector means controlling the said light shutters to cause certain lenses to light and the others to remain dark to illuminate said lenses in a variety of display patterns.

3,909,824

NON-LINEAR ANALOGUE-DIGITAL CONVERTER FOR COMPRESSION CODING

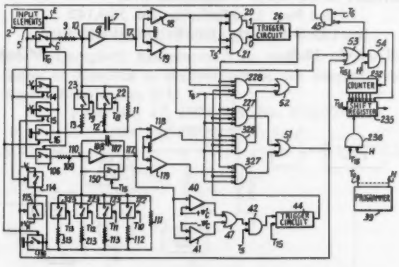
Sylvain Fontanes, Chatou, France, assignor to Compagnie Europeenne de Teletransmission (C.E.T.T.), Paris, France

Filed July 23, 1974, Ser. No. 491,138

Claims priority, application France, July 27, 1973, 73.27575

Int. Cl.² H03K *13/20*

U.S. Cl. 340—347 NT **4 Claims**



1. An analogue-digital converter for coding an analogue signal and simultaneously compressing it according to a compression characteristic $A' = f(A)$, where A is the amplitude to be coded and compressed, and A′ the value of the corresponding coded signal, said characteristic being formed by a succession of straight line segments having q different slopes, q being an integer greater than p, the latter being an integer greater than one, and the segments having the p steepest slopes corresponding to those amplitudes A which are, in absolute value, smaller than a threshold value, said analogue-digital converter comprising:

a first arrangement, including an integrator having an output, for, during first recurrent predetermined time intervals, sampling said analogue signal and charging said integrator proportionally to the amplitude of the sampled analogue signal, at least if the absolute value of this amplitude is not higher than said threshold value, with a first proportionality coefficient; means, for, in the course of further time intervals respectively following said first time intervals, non-linearly discharging said integrator as a function of time through modifying the discharge time constant of said integrator according to a predetermined programme so that the discharge time be proportional to the value A′ corresponding to the amplitude of the sampled analogue signal, at least if the absolute value of this amplitude is not higher than said threshold value, with a second proportionality coefficient;

a second arrangement including a further integrator having an output, means for, during said first time intervals, sampling said analogue signal and charging said further integrator proportionally to the amplitude of the sampled analogue signal with a third proportionality coefficient smaller than said first proportionality coefficient; means, for in the course of said further time intervals, non-linearly discharging said further integrator as a function of time, through modifying the discharge time constant of said further integrator according to a further predetermined programme so that the discharge time be proportional to the value A′ corresponding to the amplitude of the sampled analogue signal at least if the absolute value of this amplitude is higher than said threshold value, with a proportionality coefficient equal to said second proportionality coefficient;

pulse counting means, including a pulse generator for delivering pulses at a fixed frequency and a counter;

control means, coupled to the output of one of said integrators, for causing the feeding of said pulses to said counter during the discharge time of said further integrator or of said integrator of said first arrangement according to whether the absolute value of the charge of that integrator to the output of which said control means are coupled has or has not reached, at the end of the time interval during which said two integrators were charged, a limiting value indicating that the absolute value of the amplitude of the corresponding sampled analogue signal was at least equal to said threshold value.

3,909,825

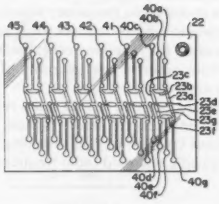
TWO PLATE VISUAL DISPLAY DEVICE

William E. Coleman, and John L. Janning, both of Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 2, 1969, Ser. No. 863,111

Int. Cl.² G08B *5/00*

U.S. Cl. 340—366 R **1 Claim**



1. An electroluminescent display device comprising:

first and second insulating planar plates, each having inside and outside surfaces;

each of said plates having a plurality of aligned channels formed on the inside surface thereof; said inside surfaces of said first and second plates being in contacting relationship to enable said channels to be formed into a plurality of cells; said first and second plates being the sole means for forming said cells;

said cells being bar-like in shape and arranged in groups to enable each group of cells to form a character when selected cells of that group are energized;

a segment electrode for each said cell conforming in shape to the associated cell and being in registration therewith; said electrodes being located on the outside surface of said first plate;

a common electrode for each said group of cells, with each said common electrode being in registration with its associated group of cells, and with said common electrodes being located on the outside surface of said second plate;

an ionizable gas filling said cells, and

at least one of said plates having pressure equalization passages interconnecting said cells;

each said group of cells being able to produce a character when its associated common electrode and selected ones of its segment electrodes are alternately energized.

3,909,826

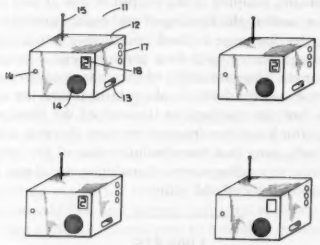
PLURAL TRANSCEIVER ALARM SYSTEM USING CODED ALARM MESSAGE AND EVERY STATION DISPLAY OF ALARM ORIGIN

Alice F. Schildmeier; J. Henry Schildmeier, both of 6030 Crows Nest Drive, Indianapolis, Ind. 46208, and Herbert A. Mitscher, 3902 Rainbow View Drive, Indianapolis, Ind. 46241

Filed Aug. 31, 1973, Ser. No. 393,343

Int. Cl. G08b *23/00*

U.S. Cl. 340—412 **20 Claims**



1. An alarm system comprising a plurality of alarm units remote from one another, each said alarm unit comprising:

sensing means for detecting an emergency condition;

coding means coupled to said sensing means for producing a coded electrical signal unique to said unit when said sensing means detects an emergency condition;

a radio transmitter coupled to said coding means for transmitting a coded radio frequency signal which contains the information in said coded electrical signal;

a radio receiver for receiving other coded radio frequency signals from other of said plurality of alarm units in the alarm system;

decoding means coupled to said radio receiver for decoding said received radio frequency signals; and

display means coupled to said decoding means for indicating the specific decoded radio frequency signals received.

3,909,827

METHOD OF AND SYSTEM FOR MICROWAVE INTERFEROMETRY

Gus P. Tricoles, San Diego, and Eugene L. Rope, El Cajon, both of Calif., assignors to General Dynamics Corporation, St. Louis, Mo.

Filed Aug. 30, 1974, Ser. No. 501,904

Int. Cl.[2] **G01S** *7/04*

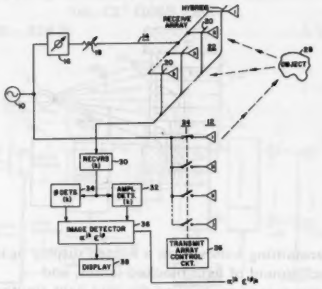
U.S. Cl. 343—17 **21 Claims**

11. A microwave interferometry system which comprises

a. transmitting means for illuminating a region with microwave energy from a first plurality of locations spaced along a first path,

b. means for receiving the energy returned from said region at different ones of a second plurality of locations spaced along a second path,

c. means for combining the energy received by said receiving means for each of said first plurality of transmitting means locations at each of said second plurality of receiving means locations with microwave energy which is coherent with said illuminating energy and which varies



cyclically in amplitude and phase to derive signals corresponding to an interference pattern, and

d. means for translating said signals into an image of objects disposed in said region.

3,909,828

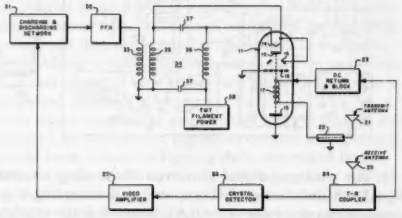
AIRBORNE REPEATER DECOY

William D. Israel, Ellicott City; William B. McCartney, Odenton, and Edward Otto Uhrig, Catonsville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 23, 1965, Ser. No. 510,142

Int. Cl.[2] **G01S** *9/56;* **H03F** *3/58;* **H04K** *3/00*

U.S. Cl. 343—18 E **9 Claims**



1. A repeater decoy comprising:

means to receive a radar pulse;

a traveling wave tube connected to receive a first portion of said radar pulse;

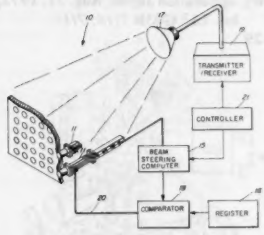
means responsive to a second portion of said radar pulse to drive said tube into conduction, said means including a pulse forming network electrically connected with said traveling wave tube and a charging and discharging network for discharging said pulse forming network upon reception of said radar pulse and for charging said pulse forming network a predetermined time thereafter, whereby said tube amplifies said first portion of said radar pulse; and

a transmitting antenna connected to the output of said traveling wave tube to radiate the amplified radar pulse.

3,909,829
ANTENNA SYSTEM

Edward J. Daly, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed July 30, 1973, Ser. No. 383,849
Int. Cl. H01q *3/24*
U.S. Cl. 343—100 SA **4 Claims**

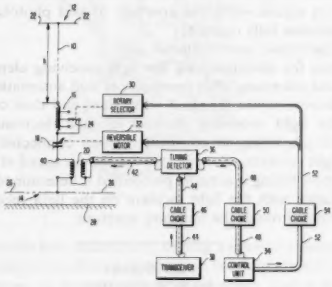


1. An antenna system, comprising:
a. means for providing a control signal indicative of the relationship between a desired beam deflection angle and a predetermined beam deflection angle; and
b. means, responsive to the control signal, for causing the antenna to operate in a selected one of a plurality of possible operating modes, such mode being selected in accordance with the relationship between the desired beam deflection angle and the predetermined beam deflection angle including means for causing one mode of such plurality of possible operating modes to produce a broadside antenna radiation pattern and another one of such modes to produce an end fire antenna radiation pattern.

3,909,830
TACTICAL HIGH FREQUENCY ANTENNA

Donn V. Campbell, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 17, 1974, Ser. No. 470,777
Int. Cl.[2] H01Q *1/32, 9/18*
U.S. Cl. 343—703 **14 Claims**

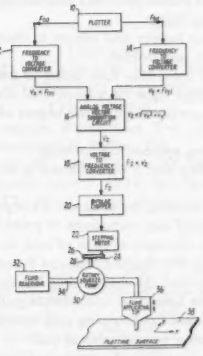


1. A tunable high frequency antenna system, typically but not restricted for use in the frequency range of from 2 to 30MHz, comprising in combination:
an electrically short, normally vertical radiating element having a physical length less than a quarter wavelength for the desired frequency of operation;
a capacitive top termination coupled to the upper extremity of said radiating element;
a first controlled electrical reactance connected in series to said radiating element comprising an inductor having a plurality of inductance taps, said first reactance being selectively adjustable in valve to provide a coarse tuning of said radiating element to a predetermined frequency band within a selected frequency range comprised of a plurality of overlapping bands;
a switch means coupled to said inductance taps for selectively connecting a portion of said inductance with said radiating element;
a second controlled electrical reactance connected in series with said radiating element and said first reactance wherein said second reactance comprises a variable capacitance to provide a fine tuning of said radiating element within said predetermined frequency band;
first conduit means for feeding a radio frequency signal to said radiating element including a broadband transformer having a secondary winding connected in series with said radiating element and said first and second reactances;
a ground system connected in series with said first and second reactances, and said secondary winding;
second circuit means coupled to said first circuit means and being responsive to the resonance state of said radiating element to provide an electrical output signal indicative of said resonant state; and
third circuit means coupled to said second circuit means and being responsive to said output signal provided thereby to generate a control signal to vary said first and second reactances in directions to effect resonance of said radiating element;
means controlled from said third circuit means for remotely operating said switch means coupled to said inductance taps for selectively shortening out a selected portion of said inductor.

3,909,831
FLUID APPLICATING DEVICE

Douglas R. Marchio, Concord, and David N. Mayfield, San Carlos, both of Calif., assignors to Levi Strauss & Co., San Franciso, Calif.

Filed Feb. 14, 1974, Ser. No. 442,496
Int. Cl.[2] G01D *15/16, 9/40*
U.S. Cl. 346—140 **5 Claims**



1. An improved fluid applicating device for an automated plotter of the type wherein fluid from a reservoir is applied to a plotting surface through a tip whose position is controlled by a programmed source wherein the improvement comprises means for receiving separate signals V_x and V_y representative of the tip velocity in orthogonal X and Y directions, respectively, means for vectorially summing the signals to produce a vector sum output signal V_z whose magnitude is proportional to the square root of the sum of the squares of the

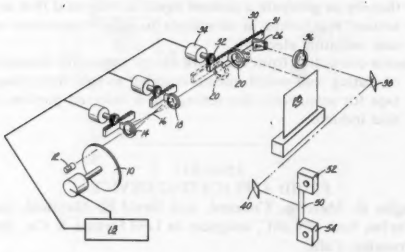
signals V_x and V_y, voltage-to-frequency convertor means responsive to the vector sum output signal V_z for generating a digital pulse train driving signal whose frequency is proportional to the magnitude of the output signal V_z, means responsive to digital pulse train driving signal for producing stepper motor driving signals, and motor driven pump means responsive to the stepper motor driving signals for positively supplying fluid from the reservoir to the tip at a flow rate substantially in a fixed relationship to the vector velocity of the movement of the tip over the plotting surface.

3,909,832

OPTICAL DEVICE FOR CONVERTING A PHOTOTYPESETTER INTO HEADLINER OPERATION

Thomas Allan Booth, Flanders, N.J., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed June 17, 1974, Ser. No. 479,614
Int. Cl.² B41B *13/00*
U.S. Cl. 354—5 **3 Claims**



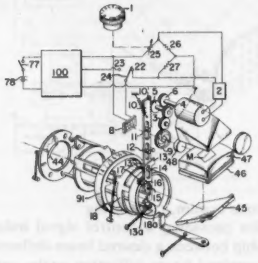
1. A convertible phototypesetter and display size type printing machine, comprising:
an orginal object holder and means to illuminate an object positioned on said holder;
a compensator lens, this lens being a primary lens positioned to gather light rays from said illuminated object and form an aerial image of the object at the focal length of the lens;
a first composing system, comprising:
1. a collimating and a de-collimating lens optically coupled;
2. means for shifting the lenses as a cooperative system to produce point size variations of print;
3. a mirror in the optical path of said de-collimating lens for bringing the image produced by said compensator, collimating and de-collimating lenses to focus on an image plane lateral to said optical path;
4. a drive system for stepping said mirror through a limited excursion in said optical path for spacing successive images in a series to produce a line of composition;
a second composing system, comprising:
said paragraph (4) drive system extended to shift said mirror of paragraph (3) beyond the said limited distance to a fixed position wherein the optical path misses said image plane; and
a secondary mirror system to project said image onto an image plane separate from said first composing system; and
means to step a web of photosensitive material in said image plane after exposure of each character to produce a single line of composition of unlimited length.

3,909,833

EXPOSURE CONTROL SYSTEM IN SINGLE-LENS REFLEX CAMERA OF THE TTL METERING TYPE

Kanehiro Sorimachi, Yokohama; Masayoshi Yamamichi, Sagamihara; Tadashi Ito, Yokohama, and Soichi Nakamoto, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1973, Ser. No. 389,469
Claims priority, application Japan, Aug. 31, 1972, 47-87274
Int. Cl.² G03B *7/14, 7/10*
U.S. Cl. 354—29 **5 Claims**



1. An exposure control system capable of operating in the shutter speed preference mode with shutter speed correction for a single lens reflex camera having an aperture presetting means for its phototaking lens, an electronic shutter for through-the-lens photometry control at fully-opened aperture and a movable mirror arranged to provide view-finding through the photo-taking lens and to move out of the phototaking light path immediately before a phototaking operation, comprising:
automatic aperture determination means provided with calculator means which include manually operable shutter speed preference setting means and a photoelectric element for receiving light which has passed through the phototaking lens with the aperture thereof fully opened and which has been reflected by said mirror;
a controllable auxiliary aperture in front of said light receiving element;
interlocking means for controlling said auxiliary aperture and said aperture presetting means conformably to each other in response to said automatic aperture determination means while the aperture of said phototaking lens remains fully opened;
an electronic shutter circuit; and
means for disconnecting the light receiving element from said calculator after operation of said automatic aperture determination means is completed and then connecting the light receiving element to said electronic shutter circuit, being so constituted when connected with the light receiving element that the shutter speed at which the phototaking is actually performed is determined in accordance with the light incident on the light receiving element through the auxiliary aperture.

3,909,834

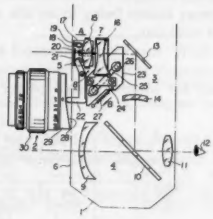
RANGE FINDER

Noriaki Sanada, and Youichi Okuno, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Dec. 20, 1973, Ser. No. 426,572
Claims priority, application Japan, Dec. 25, 1972, 48-898
Int. Cl.² G03B *13/20, 13/22*
U.S. Cl. 354—168 **10 Claims**

1. A range finder of the double image coincidence type comprising:
a finder optical system for providing an image of an object;
a deflection optical system for providing an image of an object, said system having the length of the associated

light path from an object whose distance is to be measured being different from the length of the associated light path from said object in said finder optical system; means for displacing said deflection optical system for adjusting the image of the deflection optical system to be coincident with the image of said finder optical system; means for providing variable image magnification being arranged in at least one of the light paths of said finder



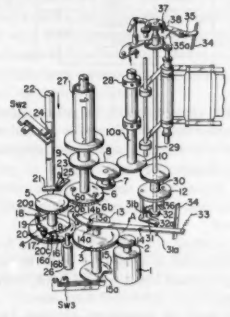
optical system, and said deflection optical system, said variable image magnification means including an optical system having positive and negative elements; and means for varying the relative distance between said positive optical element and negative optical element, said means operating in conjunction with said image coincidence means, whereby said variable image magnification equalizes the image sizes of said finder optical system and said deflection optical system.

3,909,835

DEVICE FOR CONTINUOUSLY DRIVING A CAMERA

Tadashi Ito, Yokohama, and Fumio Ito, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 14, 1973, Ser. No. 369,785
Claims priority, application Japan, June 28, 1972, 47-65328
Int. Cl. G03b *19/04*
U.S. Cl. 354—204 **9 Claims**



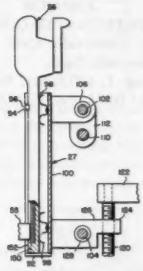
1. In a device for continuously driving a camera comprising an electric motor, a charge mechanism for film advance and shutter charge, a shutter release mechanism and a power transmission mechanism, said charge mechanism being intermittently driven through a clutch mechanism and said shutter release mechanism being driven from said electric motor during the inoperative period of said charge mechanism, thereby effecting a sequence of picture-taking operations during the revolutions of said motor, the improvements comprising an adjustable constant voltage circuit provided for energizing said electric motor, whereby the interval between successive shots of the camera is adjusted by adjusting the voltage of said circuit, and further comprising a cam for controlling said release mechanism disposed between said electric motor and said clutch mechanism, said cam being effective to maintain said release mechanism inoperative for a predetermined time after completion of the operation of said charge mechanism.

3,909,836

FILM PACK FOR MICROFICHE CAMERA

Rodney D. Vane, 9 Harvest Rd., Fairport, N.Y. 14450

Division of Ser. No. 349,236, April 9, 1973, Pat. No. 3,840,300. This application Aug. 14, 1974, Ser. No. 497,199
Int. Cl.² G03B *17/26*
U.S. Cl. 354—276 **2 Claims**



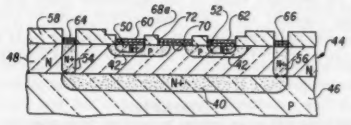
2. An article comprising a film pack for use in a microfilm camera for holding a sheet of film on which a plurality of separate frames are to be exposed, said frames being in a predetermined perpendicular array of rows and columns, said film pack including a flat back plate against which a sheet of film can be placed and a flange extending along a lower edge of said plate and a flange extending along each of two side edges of said plate, said bottom edge flange being parallel to the columns of frames on a sheet of film held in said film holder, said flanges extending perpendicularly out a predetermined distance away from a sheet of film held by said film holder, and a notch of predetermined width and depth in said bottom edge flange, said notch being in-line with a first row of frames on said film.

3,909,837

HIGH-SPEED TRANSISTOR WITH RECTIFYING CONTACT CONNECTED BETWEEN BASE AND COLLECTOR

John William Kronlage, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 788,170, Dec. 31, 1968, abandoned. This application June 7, 1971, Ser. No. 150,720
Int. Cl.² H01L *29/48, 29/56, 27/02*
U.S. Cl. 357—15 **6 Claims**



1. A semiconductor device comprising: a body of semiconductor material of one conductivity type and of relatively high resistivity, said body comprising the collector region of a transistor, a first region of opposite conductivity type to said body provided in one surface of said body, said first region comprising the base region of the transistor, a second region of said one conductivity type provided within a portion of said first region, said second region comprising the emitter region of the transistor, said first region and said second region

emerging at said one surface of said body at adjacent positions, said body including a zone emerging at said one surface of said body, the lateral periphery of said zone being completely bounded by said first region and being disposed in contiguous relationship therewith, a metal contact disposed on said zone and partially on said first region but spaced from said second region, said metal contact establishing an ohmic contact with said first region and a rectifying barrier contact with said zone to define a metal-semiconductor junction integral with the collector region of the transistor providing an internal antisaturation clamp therefor to increase the switching speed of the transistor.

3,909,838

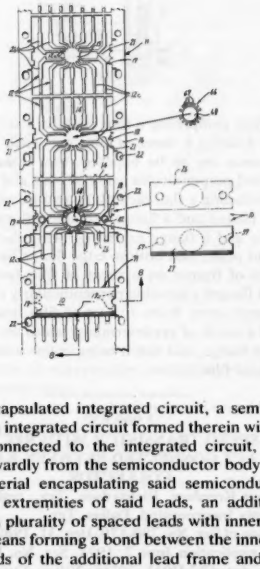
ENCAPSULATED INTEGRATED CIRCUIT AND METHOD

Fritz W. Beyerlein, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Aug. 1, 1973, Ser. No. 384,629

Int. Cl.² H01L *29/52, 29/60, 23/28*

U.S. Cl. 357—70 **10 Claims**



1. In an encapsulated integrated circuit, a semiconductor body having an integrated circuit formed therein with a plurality of leads connected to the integrated circuit, said leads extending outwardly from the semiconductor body, a body of insulating material encapsulating said semiconductor body and the inner extremities of said leads, an additional lead frame having a plurality of spaced leads with inner and outer extremities, means forming a bond between the inner extremities of the leads of the additional lead frame and the outer extremities of the leads of the first named lead frame, first and second pre-formed parts of a plastic insulating material disposed on opposite sides of the additional leads and means bonding together said first and second parts to provide a unitary assembly enclosing said semiconductor body and the inner extremities of the leads of the additional lead frame.

3,909,839

PHASE LOCKING SYSTEM FOR TELEVISION SIGNALS USING DIGITAL MEMORY TECHNIQUES

Masao Inaba; Kazuo Kashigi; Satoshi Makara, and Harunobu Nakamura, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Apr. 19, 1973, Ser. No. 352,656

Claims priority, application Japan, Apr. 24, 1972, 47-41491

Int. Cl.² H04N *9/00, 5/76*

U.S. Cl. 358—8 **10 Claims**

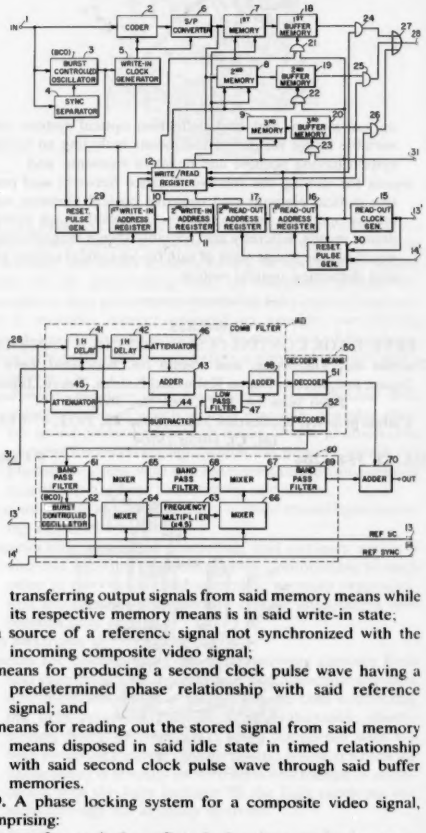
1. A phase locking system for a composite video signal, comprising:

means for producing a first clock pulse wave having a predetermined phase relationship with said composite video signal;

means for sampling and quantizing said composite video signal in timed relationship with said first clock pulse wave;

a plurality of memory means for successively storing the output of said sampling and quantizing means in response to said first clock pulse wave, with at least one of said memory means being in a write-in state, and with others of said memory means being in an idle state suitable for information read-out;

a plurality of buffer memories connected intermediate said respective memory means and said decoding means, and plural means for inhibiting said buffer memories from



transferring output signals from said memory means while its respective memory means is in said write-in state;

a source of a reference signal not synchronized with the incoming composite video signal;

means for producing a second clock pulse wave having a predetermined phase relationship with said reference signal; and

means for reading out the stored signal from said memory means disposed in said idle state in timed relationship with said second clock pulse wave through said buffer memories.

9. A phase locking system for a composite video signal, comprising:

means for producing a first clock pulse wave having a predetermined phase relationship with said composite video signal;

means for sampling and quantizing said composite video signal in timed relationship with said first clock pulse wave;

means for storing the output of said sampling and quantizing means;

a source of a reference signal;

means for producing a second clock pulse wave having a preset phase relationship with said reference signal;

means for reading out the stored signal in timed relationship with said second clock pulse wave;

means for decoding the read out signal to produce said

composite video signal wherein said read out signal includes luminance and carrier chrominance, and subcarrier signal components further comprising means for separating luminance and carrier chrominance signal components from said read out coded signal, said luminance and carrier chrominance signal components being supplied to said decoding means to produce analog luminance and carrier chrominance signals, respectively, and means for replacing the subcarrier contained in said analog carrier chrominance signal by the reference subcarrier.

3,909,840

MULTI-COLOR DATA PROCESSING METHOD

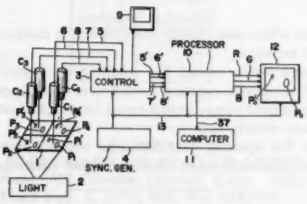
Masaaki Takahashi, Tokyo, Japan, assignor to n a c Incorporated, Tokyo, Japan

Filed Nov. 12, 1973, Ser. No. 415,001

Claims priority, application Japan, Mar. 20, 1973, 48-31406

Int. Cl.[2] H04N *9/09*

U.S. Cl. 358—81 **2 Claims**



1. A method of processing multi-color data, comprising the steps of:

simultaneously sensing by means of a plurality of image tubes a plurality of images of different densities photographed separately from an object through filters having different pass bands of light wave lengths;

applying video signals arbitrarily selected from the outputs from said image tubes to respective amplitude comparators, each of said comparators having a plurality of discriminatable levels to produce red, green and blue signals each having brightness values corresponding to the amplitude values of said video signals;

displaying said signals on a color monitor; and

determining the levels of said amplitude comparators to which the amplitudes of said video signals correspond, and which vary in dependence upon the densities of said images.

3,909,841

SYSTEM FOR CONTROLLING THE RECORDING AND REPRODUCTION OF MESSAGES

Hermann Holler, Vienna, and Gottfried Pammer, Maria Enzersdorf, both of Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Oct. 4, 1973, Ser. No. 403,625

Claims priority, application Austria, Mar. 29, 1973, 2746/73

Int. Cl.[2] G11B *19/02*

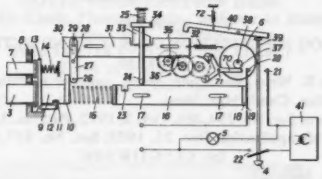
U.S. Cl. 360—3 **18 Claims**

2. A system for controlling an apparatus provided with switching means having an off-normal condition establishing a first operating mode for the recording of messages on a carrier and having a normal condition establishing a second operating mode for the reproduction of messages so recorded, comprising:

normally reset control means settable to place said apparatus in either of said operating modes depending on the condition of said switching means;

actuating means operable to place said switching means in an off-normal condition for the establishment of said first operating mode to the exclusion of said second operating mode upon a subsequent setting of said control means;

holding means responsive to operation of said actuating means for maintaining said off-normal condition of said switching means; and



release means linking said control means with said holding means for disabling the latter upon a resetting of said control means following a setting thereof in said off-normal condition of said switching means, thereby returning said switching means to said normal condition.

3,909,842

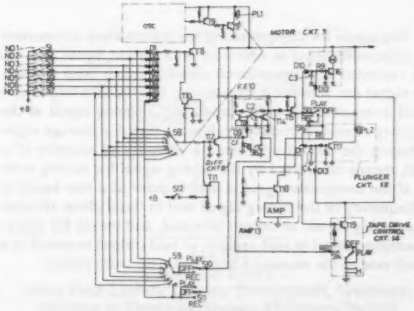
ACOUSTIC WARNING APPARATUS FOR VEHICLE

Akio Noji, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1974, Ser. No. 439,614

Int. Cl. G08b *19/00*

U.S. Cl. 360—12 **9 Claims**



1. An acoustic warning apparatus adapted for giving audible warnings corresponding respectively to abnormal conditions which may taken place in a vehicle, said apparatus comprising detecting means for independently detecting each of said abnormal conditions when they occur, a record means having recorded thereon a plurality of signals corresponding to said warnings, said signals being adapted for being read as respective audible warnings, transducer and driving means for reading one of said signals at a time, control circuit means responsive to said detector means for selecting the appropriate signal to be read and for actuating said transducer and driving means, warning stop means for interrupting the reading of a signal, warning stop release means for overriding said warning stop means and enabling a signal to be read, said warning stop release means including an ignition switch for said vehicle and a circuit operated by said switch to enable the reading of the latter said signal, said transducer and driving means including an amplifier means for amplifying the signal which is read and a motor circuit means for driving the record means, said warning stop means including a switch coupled to said amplifier means for deactivating the same, said motor circuit means being independent of the warning stop means to drive the

record means through a cycle so that it is prepared to operate anew upon the next operation of the detecting means, said record means including a magnetic tape, said transducer and driving means including a magnetic head for scanning said tape and moving means for incrementally moving the head transversely of said tape, said control circuit means including an oscillator means and first transistor means coupling the oscillator means selectively to said moving means.

3,909,843

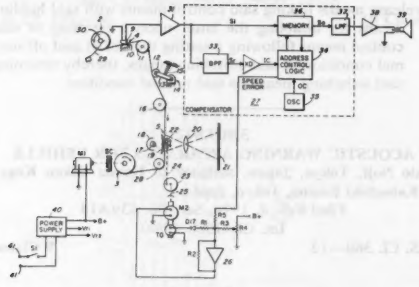
ANALOG INFORMATION STORAGE AND RETRIEVAL SYSTEM

William R. Wray, Brookline, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 294,486, Oct. 2, 1972, Pat. No. 3,850,513. This application Dec. 21, 1973, Ser. No. 427,105

Int. Cl.² G11B *5/00*

U.S. Cl. 360—27 **8 Claims**



1. Apparatus for compensating the information component of a composite signal in which an information signal that has been recorded and reproduced simultaneously with a reference signal are combined, comprising filter means responsive to said composite signal for producing a timing signal at the frequency of said reproduced reference signal, a storage register having the capacity to store a plurality of samples of a signal, means controlled by the timing signal for storing samples of the composite signal in said register at a rate equal to the frequency of the timing signal and in fixed phase relation to the timing signal, an output terminal, and means for applying samples stored in said register to said output terminal at a second rate in the sequence in which they were stored.

3,909,844

MAGNETIC RECORDING AND REPRODUCING APPARATUS WITH AN AUTOMATIC CARTRIDGE REMOVER

Toshio Kawada, Neyagawa; Tadashi Torama, Osaka, and Tamio Kobayashi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 203,347, Nov. 30, 1971, Pat. No. 3,817,539. This application Nov. 30, 1973, Ser. No. 420,598

Claims priority, application Japan, Dec. 4, 1970, 45-107701; Apr. 6, 1971, 46-21545; May 7, 1971, 46-30243

Int. Cl.² G11B *15/10*

U.S. Cl. 360—61 **6 Claims**

1. In a magnetic recording and reproducing apparatus having a magnetic head, means for ejecting a cartridge having a tape therein, comprising

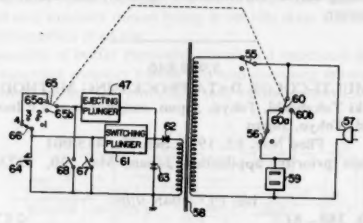
power-branching means for supplying power to components of said recording and reproducing apparatus,

a change-over switch having first and second terminals, the second terminal of said change-over switch being connected directly to said power-branching means,

a first power switch interposed between the first terminal of said change-over switch and said power-branching means, said power-branching means, change-over switch and first power switch being connected across a power supply,

an ejection plunger for ejecting said cartridge,

an automatic ejection switch connected in series with said ejection plunger and interlocked with said change-over switch, said automatic ejection switch being closed when said change-over switch is contacting its first terminal and



open when said change-over switch is contacting its second terminal,

a second power switch for coupling said ejection plunger and automatic ejection switch across said power supply, said second power switch being interlocked with said first power switch, and

means for opening said first and second power switches simultaneously upon ejection of said cartridge.

3,909,845

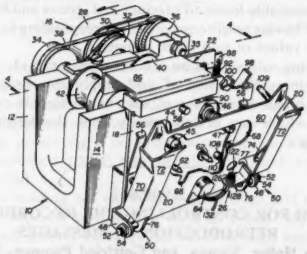
APPARATUS AND METHOD FOR SENSING THE CONDITION OF A TAPE WITHIN A TAPE CASSETTE

Kurt Rothlisberger, Morton Grove, and Richard F. Vee, Chicago, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed June 14, 1974, Ser. No. 479,682

Int. Cl.² G11B *15/08, 15/66, 23/04*

U.S. Cl. 360—74 **16 Claims**



1. An apparatus for sensing the condition of a tape carried within a tape cassette with respect to a sensing station external to the cassette comprising:

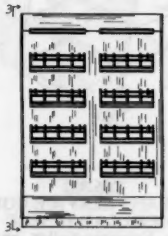
a cradle adapted for receiving a tape cassette, said cradle having a cassette loading position and a record-playback position; and

means for sensing a characteristic of the tape within the cassette said characteristic sensing means being movable from an inoperative position to an operative position, the position of said characteristic sensing means being responsive to the positioning of said cradle from said loading to said record-playback position so that said characteristic sensing means is placed in said operative position when said cradle is in said record-playback position.

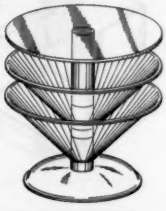
DESIGNS

SEPTEMBER 30, 1975

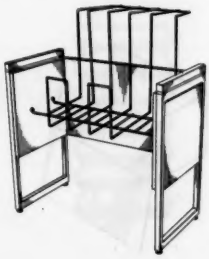
236,922
MERCHANDISE DISPLAY STAND
William S. Leath, Birmingham, Ala., assignor to Collins & Aikman
Filed Jan. 14, 1974, Ser. No. 433,160
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24



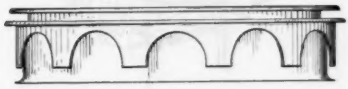
236,923
MAGAZINE RACK OR SIMILAR ARTICLE
Ila Kinzie, 725 Corona, Denver, Colo. 80218
Filed Feb. 1, 1974, Ser. No. 438,644
Term of patent 7 years
Int. Cl. D20—*02*
U.S. Cl. D6—24



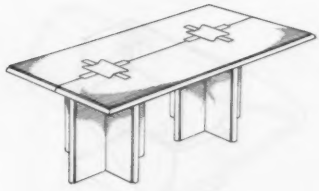
236,924
PAPER HANDLING STAND
Loren D. Stirling, Pleasanton, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 3, 1973, Ser. No. 420,830
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



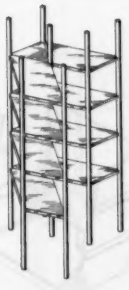
236,925
HOTEL REGISTRATION DESK
Hugh D. Clark, Phoenix, Ariz., assignor to Ramada Inns, Inc., Phoenix, Ariz.
Filed Dec. 14 1973, Ser. No. 424,847
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164



236,926
TABLE
Thomas A. Alexander, Santa Monica, Calif., assignor to Zapata Designs, Inc.
Filed Jan. 25, 1974, Ser. No. 436,439
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

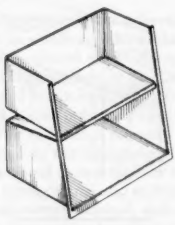


236,927
SHELF UNIT
Hans Paul Ludwig Geisler, Norderstedt, Germany, assignor to Deutsche Texaco Aktiengesellschaft
Filed Jan. 18, 1974, Ser. No. 434,718
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

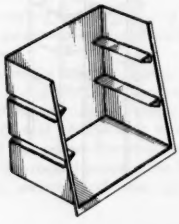


236,928
SHELF UNIT
Hans Paul Ludwig Geisler, Norderstedt, Germany (Sechslingspforte 2, 2000 Hamburg 76, Germany)
Filed Jan. 18, 1974, Ser. No. 434,719
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

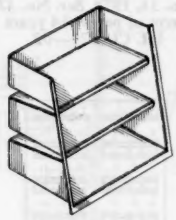
236,929
RESTAURANT SERVICE COUNTER MODULAR INSERT
Ronald B. Frazelle, Fountain Valley, and Neal B. Fuller, Anaheim, Calif., assignors to PBR Company, Anaheim, Calif.
Filed June 17, 1974, Ser. No. 480,215
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



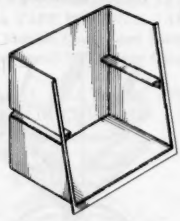
236,930
RESTAURANT SERVICE COUNTER MODULAR INSERT
Ronald B. Frazelle, Fountain Valley, and Neal B. Fuller, Anaheim, Calif., assignors to PBR Company, Anaheim, Calif.
Filed June 17, 1974, Ser. No. 480,216
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



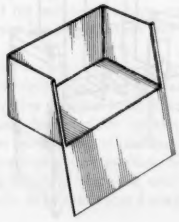
236,931
RESTAURANT SERVICE COUNTER MODULAR INSERT
Ronald B. Frazelle, Fountain Valley, and Neal B. Fuller, Anaheim, Calif., assignors to PBR Company, Anaheim, Calif.
Filed June 17, 1974, Ser. No. 480,217
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



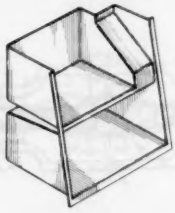
236,932
RESTAURANT SERVICE COUNTER MODULAR INSERT
Ronald B. Frazelle, Fountain Valley, and Neal B. Fuller, Anaheim, Calif., assignors to PBR Company, Anaheim, Calif.
Filed June 17, 1974, Ser. No. 480,218
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



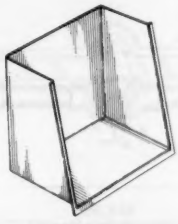
236,933
RESTAURANT SERVICE COUNTER MODULAR INSERT
Ronald B. Frazelle, Fountain Valley, and Neal B. Fuller, Anaheim, Calif., assignors to PBR Company, Anaheim, Calif.
Filed June 17, 1974, Ser. No. 480,219
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



236,934
RESTAURANT SERVICE COUNTER MODULAR INSERT
Ronald B. Frazelle, Fountain Valley, and Neal B. Fuller, Anaheim, Calif., assignors to PBR Company, Anaheim, Calif.
Filed June 17, 1974, Ser. No. 480,220
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

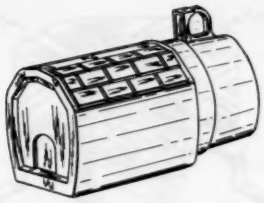


236,935
RESTAURANT SERVICE COUNTER MODULAR INSERT
Ronald B. Frazelle, Fountain Valley, and Neal B. Fuller, Anaheim, Calif., assignors to PBR Company, Anaheim, Calif.
Filed June 17, 1974, Ser. No. 480,239
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

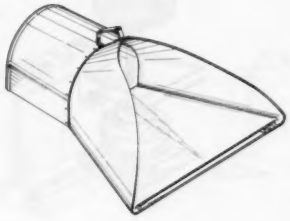


236,936
CANISTER OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Nov. 30, 1973, Ser. No. 420,523
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—79

236,937
INSULATED BOTTLE WITH ATTACHED CUP
Ronald D. Russo, Colchester, Conn., assignor to King-Seeley Thermos Co.
Filed Jan. 14, 1974, Ser. No. 433,221
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—77

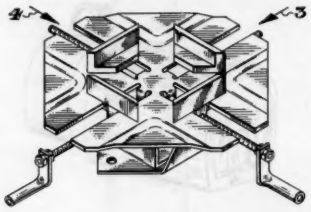


236,938
FUNNEL FOR DIRECTING YARD DEBRIS INTO A BAG OR SIMILAR ARTICLE
Henry E. Bowen, Jr., 2637 Davis Ave., Carlsbad, Calif. 92008
Filed Oct. 9, 1974, Ser. No. 513,253
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—189



236,939
FERTILIZER APPLICATOR
Alfred J. Piel, Hubbard, Iowa 50122
Filed Nov. 11, 1974, Ser. No. 522,638
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—2

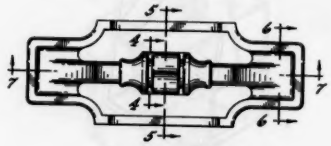
236,940
JIG FOR MAKING PICTURE FRAMES
James R. Huntley, 309 W. Crowell St., Monroe, N.C. 28110
Filed May 13, 1974, Ser. No. 469,471
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—72



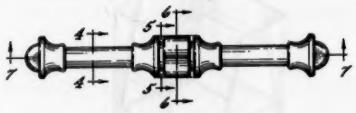
236,941
CLAMP
Robert G. Seaverns, Wheeling, Ill., assignor to Baxter Laboratories, Inc., Deerfield, Ill.
Filed Mar. 14, 1974, Ser. No. 451,327
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—73

236,942
PULL
James M. Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 13, 1974, Ser. No. 469,447
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—159

236,943
PULL
James M. Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 13, 1974, Ser. No. 469,329
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—159



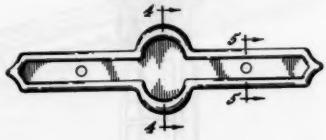
236,944
PULL
James M. Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 13, 1974, Ser. No. 469,330
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—166



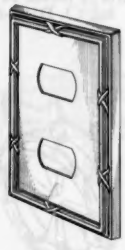
236,945
PULL
James M. Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 13, 1974, Ser. No. 469,331
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—166

236,946
PULL
James M. Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 13, 1974, Ser. No. 469,397
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—166

236,947
ESCUTCHEON
James M. Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 13, 1974, Ser. No. 469,398
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—179

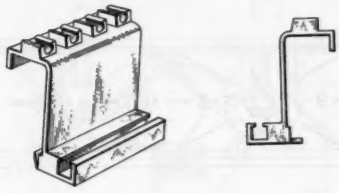


236,948
RECEPTACLE COVER PLATE
Shinjiro Mori, Tokyo, Japan, assignor to Mori Denki Manufacturing Co., Ltd., Osaka, Japan
Filed Feb. 12, 1974, Ser. No. 441,824
Claims priority, application Japan Aug. 19, 1973
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—184



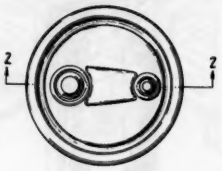
236,949
RECEPTACLE COVER PLATE
Shinjiro Mori, Tokyo, Japan, assignor to Mori Denki Manufacturing Co., Ltd., Osaka, Japan
Filed Feb. 12, 1974, Ser. No. 441,823
Claims priority, application Japan Aug. 19, 1973
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—184

236,950
VALVE BRACKET FOR AN AQUARIUM
Marvin A. Goldman, Great Neck, and Jerome N. Goldman, New York, N.Y., assignors to Penn-Plax Plastics, Inc., Garden City, N.Y.
Filed Mar. 29, 1974, Ser. No. 456,229
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233

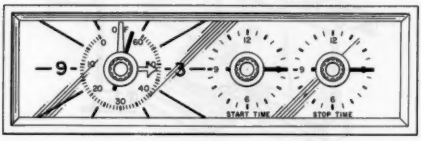


236,951
BOTTLE
Clarence L. Lorah, Marina Del Rey, Calif., assignor to United States Borax & Chemical Corp., Los Angeles, Calif.
Filed Feb. 13, 1974, Ser. No. 442,029
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60

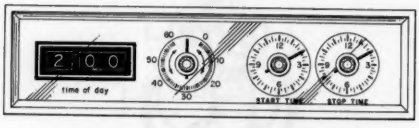
236,952
CAN END
Michael Debenham, Frankston, Victoria, Australia, assignor to The Broken Hill Proprietary Company Ltd.
Filed Apr. 2, 1974, Ser. No. 457,349
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—253



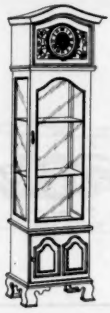
236,953
CONTROL PANEL FOR CLOCK AND TIMER
Emil Niemand, Waterbury, Conn., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Oct. 25, 1973, Ser. No. 409,376
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2



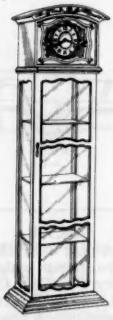
236,954
CONTROL PANEL FOR CLOCK AND TIMER
Robert L. Wooding, Wolcott, Conn., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Oct. 25, 1973, Ser. No. 409,375
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2



236,955
COMBINED CLOCK AND CURIO CABINET
Leonard Eisen, 14 Lomas Lane, Montvale, N.J. 07645
Filed Mar. 28, 1974, Ser. No. 455,714
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2

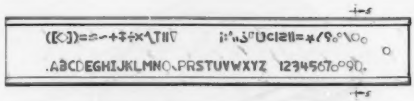


236,956
COMBINED CLOCK AND CURIO CABINET
Leonard Eisen, 14 Lomas Lane, Montvale, N.J. 07645
Filed Mar. 28, 1974, Ser. No. 455,715
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2

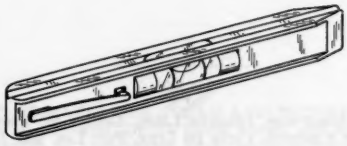


236,957
PLUMB BOB
Antoni P. Gutowski, New Britain, and Robert F. West, West Simsbury, Conn., assignors to The Stanley Works, New Britain, Conn.
Filed Mar. 27, 1974, Ser. No. 455,194
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—61

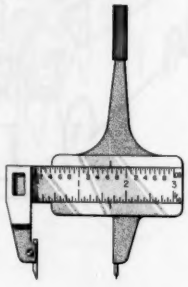
236,958
MICROFONT LETTERING GUIDE
Harold Koelichen, Jr., 49 Isardamm, D 8192 Geretsried, Germany
Continuation-in-part of abandoned design application Ser. No. 199,829, Nov. 17, 1971. This application Jan. 18, 1974, Ser. No. 434,413
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D10—62



236,959
LEVEL INSTRUMENT
Donald E. Wright, 14265 Juneau Blvd., Elm Grove, Wis. 53122
Filed May 24, 1974, Ser. No. 473,075
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—69

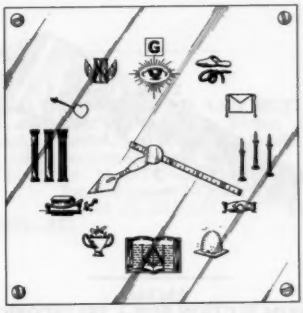


236,960
SLIDE COMPASS
Warren D. Novak, Chappaqua, N.Y. 10514
Filed Jan. 9, 1974, Ser. No. 431,843
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D10—73

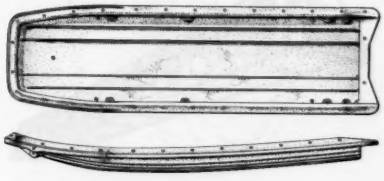


236,961
BALANCE SCALE
Deborah J. Gleason, Norfolk, Mass., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 25, 1974, Ser. No. 454,341
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—90

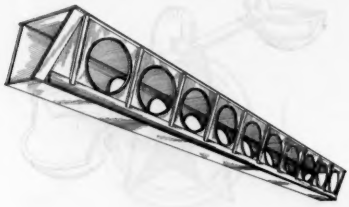
236,962
CLOCK FACE
Marion K. Summers, W. Commerce St., Brownstown, Ind. 47223
Filed July 18, 1973, Ser. No. 380,159
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—125



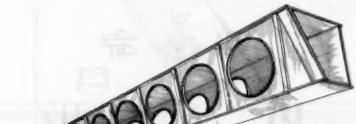
236,963
TOBOGGAN
Cedric C. Sovia, 319 S. Lake St., Forest Lake, Minn. 55025, and Kenneth W. Krengel, 1800 Highland Parkway, St. Paul, Minn. 55116
Filed May 15, 1974, Ser. No. 470,071
Term of patent 7 years
Int. Cl. D12—*14*
U.S. Cl. D12—11



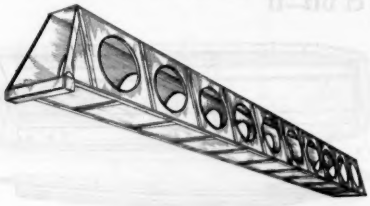
236,964
BOOM SECTION FOR A CANTILEVERED CRANE BOOM
Rupert J. Brady, 7201 Pyle Road, Bethesda, Md. 20034
Filed June 10, 1974, Ser. No. 478,150
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60



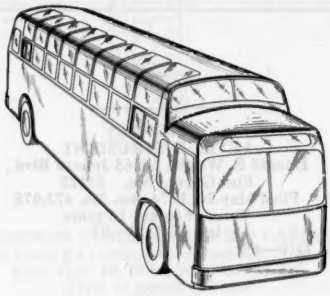
236,965
BOOM SECTION FOR A CRANE BOOM
Rupert J. Brady, 7201 Pyle Road, Bethesda, Md. 20034
Filed July 26, 1974, Ser. No. 492,268
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60



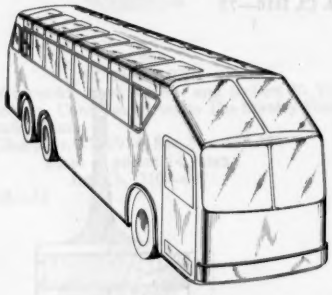
236,966
BOOM SECTION FOR A TELESCOPIC CRANE BOOM
Eugene C. Gardenhour, 926 Eastland Road, Waynesboro, Pa. 17268, and Herbert S. Robins, 18 Spring Creek Road, Hagerstown, Md. 21740
Filed Apr. 23, 1974, Ser. No. 463,352
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60



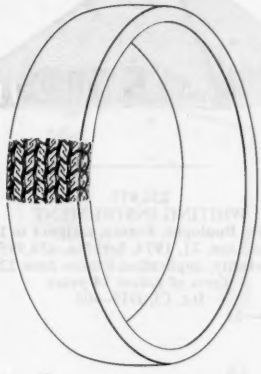
236,967
BUS
Albert Armstrong, Franklin Lakes, George W. Bauman, North Caldwell, Carlo Di Lena, Fort Lee, and Julius Eisen, Upper Saddle River, N.J., Samuel B. Jamieson, Jr., Montgomery, N.Y., and Peter Palluzi, Jersey City, and Barnett Rukin, Ho-Ho-Kus, N.J., assignors to Limousine Rental Service, Mahwah, N.J., and Body Rite Repair Co., Secaucus, N.J.
Filed July 25, 1974, Ser. No. 491,799
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—84



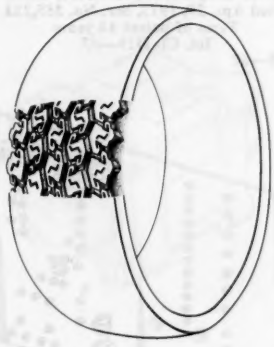
236,968
BUS
Albert Armstrong, Franklin Lakes, George W. Bauman, North Caldwell, Carlo Di Lena, Fort Lee, and Julius Eisen, Upper Saddle River, N.J., Samuel B. Jamieson, Jr., Montgomery, N.Y., and Peter Palluzi, Jersey City, and Barnett Rukin, Ho-Ho-Kus, N.J., assignors to Limousine Rental Service, Mahwah, N.J., and Body Rite Rapair Co., Secaucus, N.J.
Filed July 25, 1974, Ser. No. 491,798
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—84



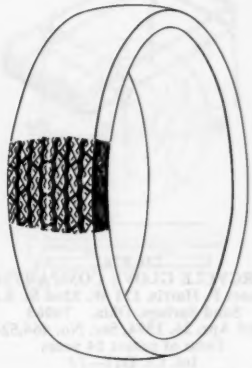
236,969
PNEUMATIC TIRE TREAD AND BUTTRESS
Arthur C. Blankenship, Howell, Mich., and Leonard J. Mysliwiec, Fort Wayne, Ind., assignors to Uniroyal, Inc.
Filed Mar. 29, 1974, Ser. No. 456,116
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



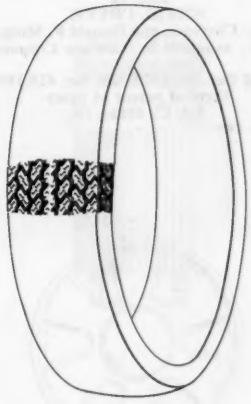
236,970
PNEUMATIC TIRE TREAD AND BUTTRESS
James H. Bierbusse, Grosse Pointe Farms, and James F. Newman, St. Clair Shores, Mich., assignors to Uniroyal, Inc.
Filed Mar. 27, 1974, Ser. No. 455,156
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—151



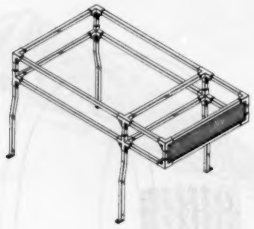
236,971
PNEUMATIC TIRE TREAD AND BUTTRESS
Allen D. Turner, St. Clair Shores, Mich., assignor to Uniroyal, Inc.
Filed Mar. 15, 1974, Ser. No. 451,627
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—151



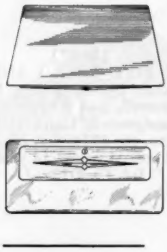
236,972
PNEUMATIC TIRE TREAD AND BUTTRESS
James H. Bierbusse, Grosse Pointe Farms, Arthur C. Blankenship, Howell, and Robert F. Busch, St. Clair Shores, Mich., assignors to Uniroyal, Inc.
Filed Mar. 18, 1974, Ser. No. 452,236
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—151



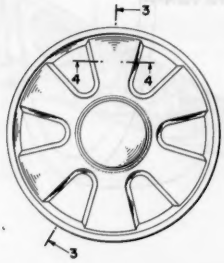
236,973
UTILITY RACK FOR TRUCKS
Edward E. Burton, 19418 Lemarsh St., Northridge, Calif. 91324
Filed Mar. 25, 1974, Ser. No. 454,105
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



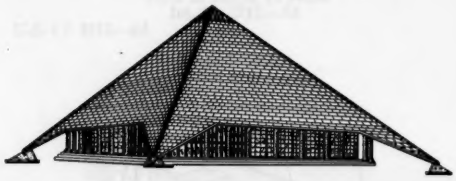
236,974
MOTORCYCLE GLOVE COMPARTMENT
James F. Harris, 111 W. 32nd St. S., Sand Springs, Okla. 74063
Filed Apr. 26, 1974, Ser. No. 464,526
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



236,975
WHEEL COVER
Joseph R. May, Chatham, and Donald F. Morgan, Bloomingdale, N.J., assignors to Amerace Corporation, New York, N.Y.
Filed Dec. 14, 1973, Ser. No. 425,180
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

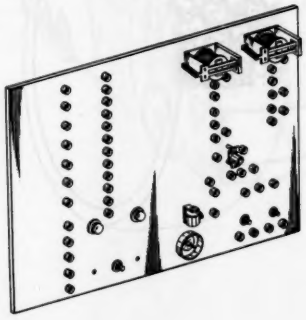


236,976
MAUSOLEUM
Max C. Cannon, 3600 Eaglerock Road, Doraville, Ga. 30340
Filed Jan. 21, 1974, Ser. No. 434,805
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R

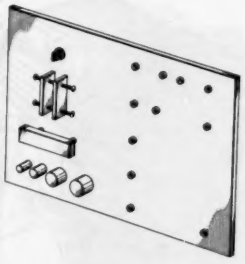


236,977
WRITING INSTRUMENT
Robert Hocq, Boulogne, France, assignor to Interlight
Filed Jan. 21, 1974, Ser. No. 434,995
Claims priority, application France June 23, 1973
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

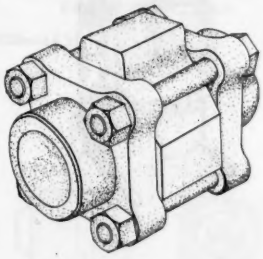
236,978
SWITCHING EDUCATIONAL BOARD
Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 27, 1973, Ser. No. 355,222
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



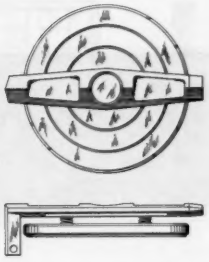
236,979
EDUCATIONAL MEASURING DEVICE BOARD
Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 27, 1973, Ser. No. 355,223
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



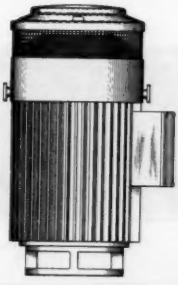
236,980
HOUSING FOR FLUID SYSTEM CONTROL OR MODIFYING DEVICE
Francis J. Callahan, Jr., Chagrin Falls, and Bernard J. Gallagher, Mentor, Ohio, and Ulrich H. Koch and Stephen Matousek, Moraga, Calif., assignors to Whitey Research Tool Co.
Filed Mar. 22, 1973, Ser. No. 343,844
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—38



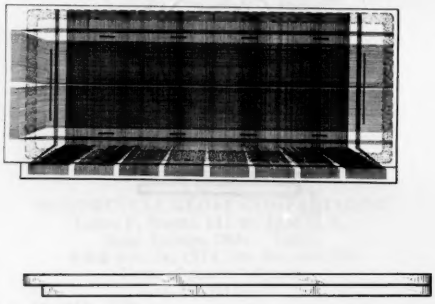
236,981
DOOR FOR VACUUM FURNACE
Donald L. Winslow, Lake Arrowhead, Calif., assignor to The J. M. Ney Company, Bloomfield, Conn.
Filed Jan. 21, 1974, Ser. No. 434,659
Term of patent 14 years
Int. Cl. D24—*01, 99*; D23—*03*
U.S. Cl. D23—82



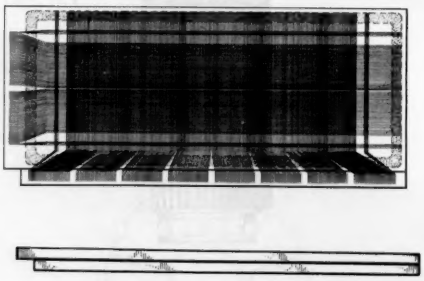
236,982
DYNAMOELECTRIC MACHINE
Robert F. Gleichman, San Jose, Calif., assignor to General Electric Company, Schenectady, N.Y.
Filed Apr. 8, 1974, Ser. No. 458,605
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5 A



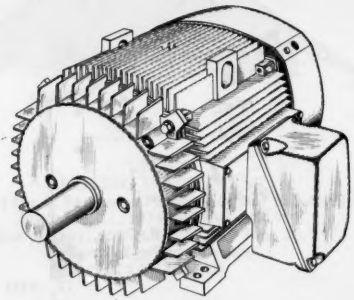
236,983
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Harold J. Hoehn, Toledo, Ohio, and Fred E. Mansur, Temperance, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio
Continuation-in-part of design application Ser. No. 260,047, June 5, 1972, now Patent No. 230,988.
This application Jan. 4, 1974, Ser. No. 431,003
The term of this patent subsequent to Mar. 26, 1988, has been disclaimed
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



236,984
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Fred E. Mansur, Temperance, Mich., and Harold J. Hoehn, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Continuation-in-part of design application Ser. No. 228,802, Feb. 23, 1972, now Patent No. 231,102.
This application Jan. 4, 1974, Ser. No. 430,997
The term of this patent subsequent to Apr. 2, 1988, has been disclaimed
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

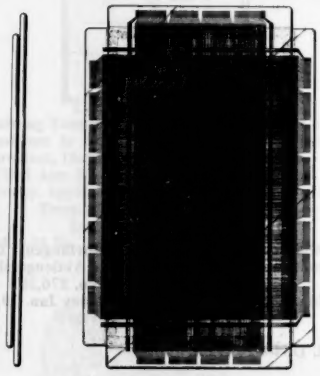


236,985
DYNAMOELECTRIC MACHINE
Frederick W. Baumann, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Feb. 5, 1973, Ser. No. 329,913
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5 A



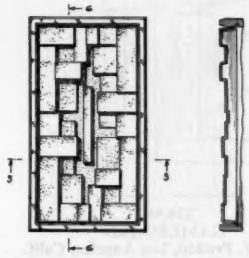
236,986
PORTABLE COMBINED CONTROL AND DISPLAY CONSOLE
Edward A. Schierholz, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed June 20, 1974, Ser. No. 481,202
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

236,987
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Eugene A. Oster and Harold Joseph Hoehn, Toledo, and Jon W. Klotz, Rossford, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Continuation-in-part of design application Ser. No. 191,960, Oct. 22, 1971, now Patent No. 230,984. This application Jan. 10, 1974, Ser. No. 432,271
The term of this patent subsequent to Mar. 26, 1988, has been disclaimed
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

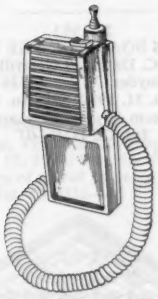


236,988
HEADPHONE EARPIECE
Warren R. Walters, St. Paul, and Michael P. Carpenter, Minneapolis, Minn., assignors to Telex Communications, Inc., Minneapolis, Minn.
Filed Dec. 10, 1973, Ser. No. 423,507
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 H

236,989
SPEAKER CABINET
Howard E. Holman, Fort Worth, Tex., assignor to Matsushita Electric Industrial Co. Ltd., Kadoma, Osaka, Japan
Filed Nov. 19, 1973, Ser. No. 417,358
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

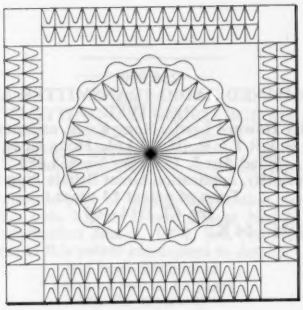


236,990
COMBINED RADIO TRANSMITTER AND RECEIVER
Peter Howard Lewis, Hong Kong, assignor to B.A.R.T.E.R. (H.K.) Ltd., Hong Kong
Filed Apr 5, 1974, Ser No 458,453
Claims priority, application Great Britain Nov 11, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K

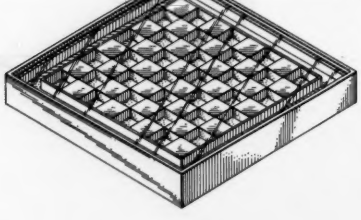


236,991
FRONT PLATE FOR A TELEPHONE STATION
Gerhard W. Batke, Ivan A. Anderson, and John W. K. Thompson, Owen Sound, Ontario, Canada, assignors to General Signal Corporation
Filed Oct. 1, 1973, Ser. No. 402,557
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

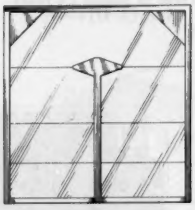
236,992
GAMEBOARD
Philip V. Pratico, Los Angeles, Calif.
(10541 Rainier St., Sun Valley, Calif. 91352)
Filed Mar. 25, 1974, Ser. No. 454,564
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



236,993
CHESS BOARD OR THE LIKE
Howard C. Davis, 89 Getzville Road, Snyder, N.Y. 14226
Filed Jan. 31, 1974, Ser. No. 438,223
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



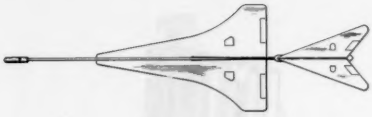
236,994
GAME BOARD
Garth J. Fisher and J. Robin Kinsey, both of P.O. Box 7887, Boise, Idaho 83707
Filed Feb. 1, 1974, Ser. No. 438,805
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 BB



236,995
SKI
Ferdinand Alexander Porsche, Doeffingen, Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft
Filed July 31, 1972, Ser. No. 276,303
Claims priority, application Germany Jan. 29, 1972
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

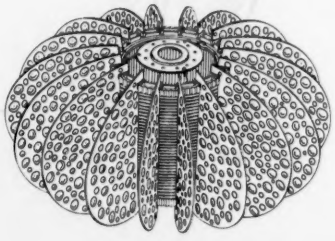
236,996
INTERLOCKING PUZZLE
Parker S. Kennedy, 1628 La Loma Drive, Santa Ana, Calif. 92705
Filed Mar. 22, 1974, Ser. No. 453,866
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M

236,997
TOY AIRPLANE OR THE LIKE
Walter C. Koval, 1206 Woodbrook, Arlington, Tex. 76011
Filed Apr. 19, 1974, Ser. No. 462,278
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH

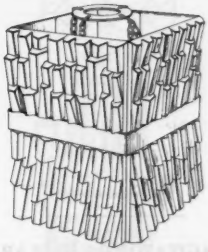


236,998
LAMP SHADE
Kenneth Yuhung Tongson, San Po Kong, Kowloon, Hong Kong, assignor to Star Industrial Co., Ltd., San Po Kong, Kowloon, Hong Kong
Filed Apr. 26, 1974, Ser. No. 464,660
Claims priority, application Great Britain Oct. 29, 1973
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D

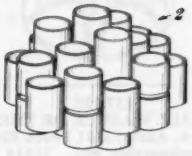
236,999
LAMP SHADE
Kenneth Yuhung Tongson, San Po Kong, Kowloon, Hong Kong, assignor to Star Industrial Co., Ltd., San Po Kong, Kowloon, Hong Kong
Filed July 8, 1974, Ser. No. 486,458
Claims priority, application Great Britain May 30, 1974
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D



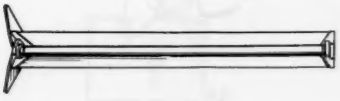
237,000
LAMP SHADE
Kenneth Yuhung Tongson, San Po Kong, Kowloon, Hong Kong, assignor to Star Industrial Co., Ltd., San Po Kong, Kowloon, Hong Kong
Filed Apr. 26, 1974, Setr. No. 464,661
Claims priority, application Great Britain Oct. 29, 1973
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D



237,001
LAMP SHADE
Bozidar M. Von Serda, 9304 Santa Monica Blvd., Beverly Hills, Calif. 90210
Filed Aug. 26, 1974, Ser. No. 500,325
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D



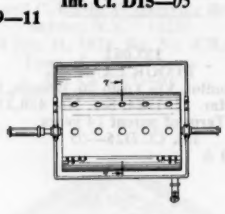
237,002
FLOOR LAMP
Sergio Gandini, Via Tosio 20, Brescia, Italy
Filed Mar. 12, 1974, Ser. No. 450,338
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 A



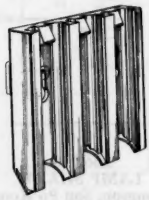
237,003
ELECTRIC LIGHT
Barbara N. Jahandideh, 2324 Kraft Place, New Orleans, La. 70114
Filed Dec. 10, 1973, Ser. No. 423,342
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

237,004
LAUNDRY AGITATOR OR SIMILAR ARTICLE
Gerald L. Blake, 29470 Everett, Southfield, Mich. 48076, and Montgomery Ferar, 8775 Nadine, Huntington Woods, Mich. 48070
Filed Jan. 11, 1974, Ser. No. 432,470
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—1 C

237,005
GOLF BALL WASHER OR THE LIKE
Fred A. Akel, 13301 Beach Blvd., Jacksonville, Fla. 32216
Filed Jan. 24, 1974, Ser. No. 436,060
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—11



237,006
COIN DISPENSER
Eugene B. Gray, Alton Bay, N.H. 03810
Filed June 10, 1974, Ser. No. 478,081
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D52—4 R



237,007
AERATOR FOR A SEWAGE SYSTEM
David S. MacLaren, 21176 Brantley Road, Shaker Heights, Ohio 44120
Continuation of abandoned design application Ser. No. 276,078, July 28, 1972. This application Apr. 17, 1974, Ser. No. 461,493
Term of patent 14 years
Int. Cl. D15—*99;* D23—*01*
U.S. Cl. D55—1 D

237,008
GUITAR BODY
Samar Elliot Cade, 902 Lawton St., Akron, Ohio 44320
Filed Dec. 19, 1973, Ser. No. 426,071
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

237,009
RADIO
Yukio Izuhara, Matsudo, Japan, assignor to Soundesign Corporation (Hong Kong) Limited, Kowloon, Hong Kong
Filed Jan. 30, 1974, Ser. No. 437,996
Claims priority, application Great Britain Oct. 1, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

237,010
COMBINED RIBBON AND CARTRIDGE THEREFOR
Keith L. Gnutzman, Alameda, and Ernest P. Hess, Castro Valley, Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 3, 1973, Ser. No. 420,989
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A

237,011
SUBMERSIBLE PUMP
Rolf Stroberg, Langsjovagen 28, Alvsjo, Sweden, and Bo Ljunglof, Bredangsvagen 55, Skarholmen, Sweden
Filed Sept. 23, 1974, Ser. No. 508,000
Claims priority, application Sweden Mar. 25, 1974
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1 R

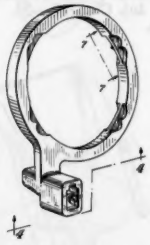
237,012
CHAIN CANDLE
Siegfried Steinhart, 14 Obere Ganshalde, 8908 Krumbach, Germany
Original design application Aug. 22, 1972, Ser. No. 282,659, now Patent No. 233,175. Divided and this application July 26, 1974, Ser. No. 492,281
Claims priority, application Germany Feb. 25, 1972
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1 B

237,013
CHAIN CANDLE
Siegfried Steinhart, 14 Obere Ganshalde, 8908 Krumbach, Germany
Original design application Aug. 22, 1972, Ser. No. 282,659, now Patent No. 233,175. Divided and this application July 26, 1974, Ser. No. 492,357
Claims priority, application Germany Feb. 25, 1972
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1 B

237,014
CHAIN CANDLE
Siegfried Steinhart, 14 Obere Ganshalde, 8908 Krumbach, Germany
Original design application Aug. 22, 1972, Ser. No. 282,659, now Patent No. 233,175. Divided and this application July 26, 1974, Ser. No. 492,358
Claims priority, application Germany Feb. 25, 1972
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1 B

237,015
CHAIN CANDLE
Siegfried Steinhart, 14 Obere Ganshalde, 8908 Krumbach, Germany
Filed Jan. 9, 1974, Ser. No. 432,038
Claims priority, application Germany July 19, 1973
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1 B

237,016
X-RAY COLLIMATING EXTENSION TUBE POSITIONING RING FOR POSTERIOR TYPE DENTAL X-RAY FILM HOLDERS
Charles F. Stevenson, Elgin, Ill., assignor to Rinn Corporation, Elgin, Ill.
Filed Apr. 18, 1974, Ser. No. 461,951
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 H

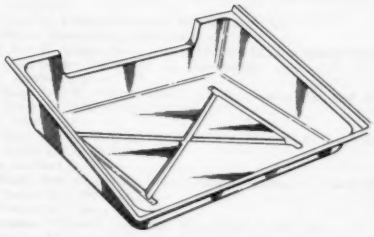


237,017
NASAL INHALANT APPLICATOR
Henri Beaufour, Dreux, France, assignor to Laboratoires Beaufour, Dreux, France
Filed Dec. 26, 1973, Ser. No. 428,416
Claims priority, application Great Britain July 4, 1973
Term of patent 14 years
Int. Cl. D9—*01;* D24—*04*
U.S. Cl. D83—1 N

237,018
FLEXIBLE CONTAINER FOR MEDICAL FLUIDS
Harold Anthony Betka and Albert Frank Bujan, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Dec. 10, 1973, Ser. No. 423,323
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 U

237,019
SURGICAL RETRACTOR
Robert Arthur Wigmore, 6550 Sherbrooke St. W., Apt. 1902, Montreal, Quebec, Canada, and Henry R. Shibata, 476 Beverley Ave., Mount Royal, Montreal, Quebec, Canada
Filed June 25, 1973, Ser. No. 373,006
Claims priority, application Canada Dec. 27, 1972
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 R

237,020
COMBINED SUPPORT AND STORAGE TRAY FOR AN EDUCATIONAL KIT OR SIMILAR ARTICLE
Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.
Filed Feb. 26, 1973, Ser. No. 335,638
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R



237,021
ATTACHE CASE
Aron Chilewich, 180 East End Ave., New York, N.Y. 10028
Filed Jan. 11, 1974, Ser. No. 432,502
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 B

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF SEPTEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. C. Hamilton & Co.: *See—*
Latter, Geoffrey, 3,909,173.

A. O. Smith Corporation: *See—*
Clark, Norman D., 3,909,648.

A.P.V. Company Limited, The: *See—*
Wright, Felix William, 3,908,757.

A/S Kongsberg Vapenfabrikk: *See—*
Dahl, Bjorn, 3,908,551.

A-T-O Inc.: *See—*
Carter, Sidney T., 3,908,815.

AB Mecman: *See—*
Engstrom, Hans B., 3,909,017.

Abbondanti, Alberto, to Westinghouse Electric Corporation. Flux control system for controlled induction motors. 3,909,687, Cl. 318-227.000.

Abe, Akira; and Usui, Yoshio, to Fuji Photo Film Co., Ltd. Process of treating waste water. 3,909,403, Cl. 210-32.000.

Abe, Masahiro, to Glory Kogyo Kabushiki Kaisha. Infeed mechanism for sheet processing apparatus. 3,908,982, Cl. 271-21.000.

Abel, Heinz: *See—*
Toepfl, Rosemarie; Abel, Heinz; and Maeder, Arthur, 3,909,494.

Abex Corporation: *See—*
Born, Ellis H.; Viles, Alan H.; Adams, Cecil E.; and Thurston, David L., 3,908,519.

Abraham, Donald D.: *See—*
Miller, Ralph R., III; and Abraham, Donald D., 3,909,772.

Abraham, Wayne G.; and Oyafuso, Robert T., to Varian Associates. YIG-tuned push-pull microwave diode oscillator. 3,909,746, Cl. 331-96.000.

ACF Industries, Incorporated: *See—*
Malo, Lowell L., 3,908,558.

Acres, Gary James Keith, to Johnson, Matthey & Co., Limited. Catalysis. 3,909,452, Cl. 252-455.00R.

Acurex Corporation: *See—*
Adler, Alan J., 3,909,811.

Adachi, Shigeo: *See—*
Takagi, Izumi; and Adachi, Shigeo, 3,908,475.

Adams, Cecil E.: *See—*
Born, Ellis H.; Viles, Alan H.; Adams, Cecil E.; and Thurston, David L., 3,908,519.

Adams, James D. Cambering attachment for truss assembly jig using canted roller press. 3,908,259, Cl. 29-432.000.

Adams, James E.: *See—*
Haas, Werner E. L.; and Adams, James E., 3,909,114.

Adams, Milton R.: *See—*
Jansen, Harvey B.; and Adams, Milton R., 3,909,159.

Adamson, Gerald James; and O'Grady, James K., to Filter Queen Corporation Limited, The. Apparatus for scrubbing rugs, floors and the like. 3,908,220, Cl. 15-50.00R.

Addressograph Multigraph Corporation: *See—*
Booth, Thomas Allan, 3,909,832.
Olson, Lorin P., 3,909,593.
Spoth, James J.; and Robbins, Robert J., 3,909,724.

Adler, Alan J., to Acurex Corporation. Multiplexed telemetering system for a plurality of signal sources. 3,909,811, Cl. 340-189.000.

Advanced Machine Design Company: *See—*
Moelbert, Heinrich, 3,908,496.

Aetna Bearing Company: *See—*
Keleshian, John V., 3,909,086.

Afanador, Carlos P.; and Tschabrun, Richard G., to Dayton-Walther Corporation. Interlocking knuckle assembly. 3,908,480, Cl. 74-511.000.

Agan, Ernest W., Jr.; Childers, Grady P.; Frost, Walter Wade; and Hunter, John P., Jr., to Oxford Industries, Inc. Garment production process. 3,908,250, Cl. 28-76.00T.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Riess, Gerard; Periard, Jacques; and Banderet, Albert, 3,909,478.

Agfa-Gevaert Aktiengesellschaft: *See—*
Weber, Klaus; Zahn, Wolfgang; Hujer, Friedrich; and Beier, Siegfried, 3,909,171.

Agfa-Gevaert N.V.: *See—*
Gilliams, Yvan Karel; Van Engeland, Jozef Leonard; and De Volder, Noel Jozef, 3,909,433.

Aikawa, Hiroshi, to Nissan Motor Company Limited. Suspension unit for a motor vehicle shock absorber. 3,909,035, Cl. 280-124.00F.

Aizawa, Tsuneo. Speed-reducing drive mechanism for bandsaw machines. 3,908,501, Cl. 83-788.000.

Ajax Hardware Corporation: *See—*
Read, George D.; and Gorton, Howard B., 3,908,226.

Ajinomoto Co., Inc.: *See—*
Tsuchida, Takayasu; Matsui, Hiroshi; Enei, Hitoshi; and Yoshinaga, Fumihiro, 3,909,353.

Akayama, Jinichi; Yokozeki, Masanori; Otsubo, Hideo; and Igata, Sueta, to Nippon Steel Corporation. Method for rapid cooling of high temperature metal pieces. 3,909,315, Cl. 148-153.000.

Akers, David A. Cylindrical chess game apparatus. 3,909,000, Cl. 273-131.0AD.

Akiyama, Shunichi; Doi, Munebaru; Arai, Yoshiaki; Nakao, Yoshio; and Fukuda, Hideo, to Takeda Chemical Industries, Ltd. Production of yeast biomass. 3,909,352, Cl. 195-28.00R.

Aktiebolaget Electrolux: *See—*
Fagerstrom, Kurt Gunnar; Goransson, Bertil Henry; and Hellstrom, Per-Olov, 3,908,533.

Aktiebolaget IRO: *See—*
Jacobsson, Kurt Arne Gunnar, 3,908,921.

Aktiengesellschaft Brown, Boveri & Cie.: *See—*
Heil, Werner; and Moser, Heinrich, 3,908,265.

Aktieselskabet Jens Villadsens Fabriker: *See—*
Garn, Ole; and Corlin, Arne, 3,909,144.

Aldinger, Karl E., to Kimberly-Clark Corporation. Fiber recovery system and method of recovery. 3,909,397, Cl. 209-3.000.

Alembik, Alfred. Piece of furniture for lying and sitting. 3,908,210, Cl. 5-29.000.

Alexander, George B.; and Carpenter, Norman F., to Dow Chemical Company, The. Noncorrosive acid, solvent and nonionic surfactant composition. 3,909,437, Cl. 252-143.000.

Alinari, Carlo. Bourdon tube type pressure measuring instrument. 3,908,462, Cl. 73-418.000.

Allais, David C.; and Host, Rudolph P., to Interface Mechanisms, Inc. Circuit for establishing a reference voltage in bar code readers. 3,909,594, Cl. 235-61.11E.

Allatt Limited: *See—*
Hoffman, Richard C., 3,909,146.

Allegret, Francis: *See—*
Patrie, Jos; and Allegret, Francis, 3,909,367.

Allen, John Douglas, to British Gas Corporation. Gas pollution monitor. 3,909,204, Cl. 23-254.00E.

Allen, William M.: *See—*
Bajcar, Miles S.; Marshall, Robert H.; and Allen, William M., 3,908,537.

Allied Chemical Corporation: *See—*
Barrett, Joseph J., 3,909,132.
Dench, John E.; Knutson, Harry; and Seven, Manfred K., 3,909,280.
Figiel, Francis J., 3,909,431.
Hartman, Paul F., 3,909,463.
Neinart, Louis F.; Linares, Robert C.; Jeges, Paul; and Blank, Zvi, 3,908,644.

Allied Steel & Tractor Products, Incorporated: *See—*
Century, Bernard A., 3,909,149.

Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D. Ice skate holder. 3,909,718, Cl. 224-45.00S.

Allsop, James D.: *See—*
Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D., 3,909,718.

Allsop, Jon I.: *See—*
Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D., 3,909,718.

Allsop, Michael G.: *See—*
Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D., 3,909,718.

Alm, Howard G.: *See—*
Rozema, Arthur L.; and Alm, Howard G., 3,909,769.

Altenweger, Alois, to Zellweger, Ltd. Warp-tying frames combined with a carriage. 3,908,249, Cl. 28-49.000.

Alto Corporation: *See—*
Noel, Eugene M., 3,908,847.

Alupak AG: *See—*
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Amagi, Yasuo: *See—*
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AMBAC Industries, Inc.: *See—*
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Ambar Investment Inc.: *See—*
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Ambitex Corporation and Cendev Corporation, Ambitex Company: *See—*
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Amblard, Paul Alexis: *See—*
Paris, Rene Antoine; Amblard, Paul Alexis; and Rousset, Abel Claude, 3,909,247.

Americal Corporation: *See—*
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American Acupuncture Medical Instruments, Inc.: *See—*
Man, Pang L.; Chen, Calvin H.; and Donofrio, William T., 3,908,669.

American Aniline Products, Inc.: *See—*
Renfrew, Edgar Earl; and Pons, Henry Wolfgang, 3,909,198.

American Can Company: *See—*
Bowen, William Edmund, 3,909,582.

American Chain & Cable Company: *See—*
Pannullo, Louis A.; and MacKenzie, Donald D., 3,908,458.
American Cyanamid Company: *See—*
Bollyky, Laszlo Joseph; and Whitman, Robert Henry, 3,909,440.
Culmone, Vincent A.; and Kaniecki, Thaddeus J., 3,909,461.
Takacs, Edward Andrew, 3,909,395.
Tucker, Robert Jerome; and Spector, Richard, 3,909,442.
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American Microsystems, Inc.: *See—*
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American Optical Corporation: *See—*
Harris, George Jerry; and DePedro, Donald, 3,909,792.
American Sterilizer Company: *See—*
Brendgord, Thomas, 3,908,831.
Amerock Corporation: *See—*
Newcomer, John I., 3,908,228.
Ames, Ira R., Jr.: *See—*
Morse, Walter H.; and Ames, Ira R., Jr., 3,908,805.
AMF Incorporated: *See—*
Davidson, William G., 3,908,777.
Neville, Richard Ernest Gartside; and Bardsley, Frank Baxter, 3,908,817.
Ammons, Virgie M. Fireplace damper actuating tool. 3,908,633, Cl. 126-288.000.
Amoco Production Company: *See—*
Broding, Robert A.; and Landrum, Ralph A., Jr., 3,909,776.
AMP Incorporated: *See—*
Campari, Luigi; and Bruni, Aldo, 3,909,506.
Demler, Henry William, Sr., 3,908,261.
Scheingold, William Samuel; Purdy, Harold Lawrence; and Youngfleish, Frank Christian, 3,909,564.
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Ampex Corporation: *See—*
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Anatronics Corporation: *See—*
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Anchor Hocking Corporation: *See—*
Foucart, Donald D.; and Cottrill, Jon R., 3,909,289.
Anders, Roland A.: *See—*
Mend, William G.; and Anders, Roland A., 3,909,520.
Andersen, Alfred Frederick. Minimum stressed wrench. 3,908,488, Cl. 81-121.00R.
Andersen, Charles M. Automatic boiler blowdown apparatus and method. 3,908,605, Cl. 122-382.000.
Andersen, James M.: *See—*
Sargent, Ronald J.; Vanden Broek, Christiaan J. H.; Henke, Arthur W.; Andersen, James M.; Stansbury, Benjamin H., Jr.; Kaminski, Stephen H.; and Mayer, Edward, 3,908,202.
Anderson, Alfred T.; Gordy, Robert S.; and Sanders, David E., to NCR Corporation. Slow switch for bandwidth change in phase-locked loop. 3,909,735, Cl. 329-122.000.
Anderson Bros. Mfg. Co.: *See—*
Erhardt, Stefan, 3,908,340.
Anderson, Jerrold L.; and Powell, Thomas C., to NCR Corporation. Microcapsule. 3,909,444, Cl. 252-316.000.
Anderson, Kenneth E.: *See—*
Hunter, Jack A.; and Anderson, Kenneth E., 3,909,418.
Anderson Power Products, Inc.: *See—*
Winkler, Edward D., 3,909,099.
Andersson, P. Leonard, to Roberts Numbering Company. System for printing on a moving web. 3,908,542, Cl. 101-79.000.
Ando, Hisashi: *See—*
Soeno, Ko; Ando, Hisashi; and Sakamoto, Hiroshi, 3,909,763.
Andoh, Shizuo; Urade, Toshinori; Hirose, Tadatsugu; and Shirouchi, Yasunari, to Fujitsu Ltd. Driving system for a gas discharge panel. 3,909,665, Cl. 315-169.0TV.
Andrzejewski, Stanley J.: *See—*
Young, Robert R.; Randleman, Patrick L.; Wilborn, Roger C.; and Andrzejewski, Stanley J., 3,909,203.
Angele, Eduard; Schreiber, August; and Seipp, Jurgen, to Schreiber, August. Grate rake for cleaning a grate arranged in a water conduit. 3,909,411, Cl. 210-159.000.
Angell, Abraham L., Jr.: *See—*
Majeau, Henrie L.; Barnes, Roland O.; Hove, Robert G.; and Angell, Abraham L., Jr., 3,909,534.
Anorga, Carlos J.; and Chess, Samuel, to Upjohn Company, The. Flame retardant flexible polyanethane foam containing alumina trihydrate. 3,909,464, Cl. 260-2.5AJ.
Ansari, Amir H. Concentric loop intrauterine device. 3,908,646, Cl. 128-130.000.
Anton Schwarzkopf, Firma: *See—*
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Aoshima, Yasuo: *See—*
Ikegaya, Masashi; Suzuki, Matsuo; and Aoshima, Yasuo, 3,909,371.
Aoyama, Yoshio, to Dai-Doh Plant Engineering Corporation. Method for treating alkaline waste streams containing aluminum dissolved therein. 3,909,405, Cl. 210-46.000.
Apel, Ernst, to Ernst Apel, Feinmechanische Erzeugnisse. Mount for a telescopic sight. 3,908,950, Cl. 248-291.000.
Applied Fiberoptics Incorporated: *See—*
Buhler, Rato, 3,909,106.
Applied Power, Inc.: *See—*
Hicks, John R., 3,908,961.
Arai, Yoshiaki: *See—*
Akiyama, Shunichi; Doi, Munebaru; Arai, Yoshiaki; Nakao, Yoshio; and Fukuda, Hideo, 3,909,352.
Aramaki, Keiichi, to Nippon Kokan Kabushiki Kaisha. Open top housing type universal rolling mill. 3,908,426, Cl. 72-238.000.
Arbaugh, Roland R. Golf putting game. 3,909,006, Cl. 273-176.0AA.
Argade, Shyam D.: *See—*
Mueller, Andrew G.; Krumpelt, Michael; Pitteroff, Walter A.; Argade, Shyam D.; and Louvar, Joseph F., 3,909,382.
Armco Steel Corporation: *See—*
Jasper, Joseph C., 3,909,250.
Armonies, Erich; Keiner, Horst; and Steup, Herbert, to Menk Apparatebau GmbH. Heating or cooling radiator. 3,908,758, Cl. 165-174.000.
Armstrong, Robert G.; and Nebesar, George C., to Park-Ohio Industries, Inc. Method for inductively heating and quench hardening surfaces on a crankshaft. 3,909,314, Cl. 148-146.000.
Arnaud, Jean-Claude: *See—*
Bore, Pierre; Arnaud, Jean-Claude; and Kalopissis, Gregoire, 3,908,672.
Arnold, George R., to Silverado Industries, Inc. Orthodontic model. 3,908,272, Cl. 32-71.000.
Arsena, Vito J., to General Electric Company. Electric lamp with light-diffusing coating. 3,909,649, Cl. 313-116.000.
Aryamane, Avinash P.: *See—*
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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ishida, Shinichi; Oshima, Noboru; Kurita, Kunio; Suzuki, Isamu; and Ohno, Hidetoshi, 3,909,408.
Asai, Katsutoshi: *See—*
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Ashco Ohio Products, Inc.:
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Ashcroft, Ian Reginald: *See—*
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Asnis, Avraam Efimovich; Gretsky, Jury Yakovlevich; Kuznetsov, Evgeny Petrovich; Slavinsky, Nikolai Alexandrovich; and Melnichenko, Igor Mikhailovich. Welding wire. 3,909,253, Cl. 75-170.000.
Asp, Nils, to Svedala-Abra AB. Devices for progressive throttling to complete shut-off of the discharge in machines for dispensing fluidizable material in weight portions. 3,908,773, Cl. 177-122.000.
Aspro, Inc.: *See—*
Killian, Robert J.; and Sproul, Nolte V., 3,908,421.
Assmus, Friedrich, to Gebruder Junghans GmbH. Ratchet locking arrangement. 3,908,357, Cl. 58-117.000.
Astatic Corporation, The: *See—*
Cvetko, Henry J.; and Williams, Michael, 3,909,009.
Astrom, Karl Gustav. Badminton ball. 3,908,994, Cl. 273-61.00R.
Atlantic Richfield Company: *See—*
Borchert, Alfred E.; Condo, Albert C.; Gzemski, Felix C.; McGrogan, John F.; and Wilbur, Benjamin C., 3,909,474.
DeVries, Donald L.; Chao, Tai S.; and Vitchus, Bernard C., 3,909,428.
Rieve, Robert W.; and Shalit, Harold, 3,909,391.
Turnquest, Byron W.; Chao, Tai S.; and Broman, Victor E., 3,909,420.
Audi Nsu Auto Union Aktiengesellschaft: *See—*
Stahle, Hermann, 3,908,610.
Audivox, Inc.: *See—*
Johanson, Donald L., 3,909,556.
Augier de Cremiers, Francois, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for finding a fixed synchronization bit in a frame of unknown length. 3,909,528, Cl. 178-69.50R.
Aumayer, Hansruedi, to I-T-E Imperial Corporation. Contact structure for high voltage gas blast circuit interrupter. 3,909,571, Cl. 200-148.00R.
Aurenz, Hans-Dieter, to Jenaer Glaswerk Schott & Gen. Optical fiber image magnifying apparatus. 3,909,109, Cl. 350-96.00B.
Automated Building Components, Inc.: *See—*
Jureit, John Calvin; and Seipos, Andrew G., 3,908,850.
Automobiles Peugeot: *See—*
Pennec, Jean-Claude, 3,908,312.
Avco Corporation: *See—*
Odom, James T., 3,909,730.
Avery Products Corporation: *See—*
Seidl, Maximilian R.; Seidl, Joachim; and Henry, Walton M., 3,908,544.
Avon, Urbain. Diving towers. 3,908,988, Cl. 272-66.000.
Awaya, Juichi: *See—*
Hata, Toju; Omura, Satoshi; Katagiri, Michiko; Awaya, Juichi; Kuyama, Shimpei; Higashikawa, Shizuo; Yasui, Kazuomi; and Terada, Haruko, 3,909,361.
Ayer, Francois N.; Cotter, Richard B.; and Chambers, Richard E., to United States of America, Air Force. Panel grid module construction system. 3,909,145, Cl. 404-40.000.
Ayoub, Raymond: *See—*
Ayoub, Robert; and Ayoub, Raymond, 3,908,825.
Ayoub, Robert; and Ayoub, Raymond. Marble-carrier case. 3,908,825, Cl. 206-315.000.

Ayres, Waldemar A., to Becton, Dickinson and Company. Plasma separator with squeezed sealant. 3,909,419, Cl. 210-518.000.

Azbell, James W.: *See*—
Fretwell, Richard D.; Azbell, James W.; and Mason, Edwin E., 3,909,526.

Azrad (Weisz), Anat. Method for activation of bentonites. 3,909,454, Cl. 252-455.00R.

B. F. Goodrich Company, The: *See*—
Gilles, Jack C., 3,909,491.
Gilles, Jack C., 3,909,493.

Baba, Kosaku; and Hosaka, Akio, to Nissan Motor Company Limited. Fault recorder for trigger mechanism of motor vehicle safety device. 3,909,777, Cl. 340-52.00H.

Bachman, William John: *See*—
Wilson, Robert Morris; and Bachman, William John, 3,909,691.

Bachmann, Horst, to Langenstein & Schemann Aktiengesellschaft. Power press with a flywheel and spindle drive. 3,908,437, Cl. 72-452.000.

Badger Meter, Inc.: *See*—
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Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
Erdmann, Hans; and Miller, Franz Friedrich, 3,909,193.
Fischer, Adolf, 3,909,232.

Baghdady, Elie Joseph, to Massachusetts Institute of Technology. Frequency modulation receiver. 3,909,725, Cl. 325-347.000.

Bagley, William E. Pipe jack. 3,908,960, Cl. 254-29.00R.

Bajcar, Miles S., to Chemetron Corporation. Vacuumizing apparatus with internal flow control valve. 3,908,536, Cl. 99-472.000.

Bajcar, Miles S.; Marshall, Robert H.; and Allen, William M., to Chemetron Corporation. Vacuumizing apparatus. 3,908,537, Cl. 99-472.000.

Baker, Alfred Lynn, to RCA Corporation. Signal switching apparatus for compensating record defects. 3,909,518, Cl. 178-6.60R.

Baker, Halsted W.; and Gottfried, Arthur H., to United States of America, Army. Low-cost periodic permanent magnet and electrostatic focusing scheme for electron tubes. 3,909,651, Cl. 315-3.500.

Baker, Howard S.: *See*—
Jagoda, Neil H.; Kubierschky, Klaus; and Baker, Howard S., 3,909,821.

Baker, Ivan Edward: *See*—
Landis, George Gideon; Nosse, Joseph Rudolph; and Baker, Ivan Edward, 3,909,586.

Baker, Richard H.; and Bannister, Lawrence H., to Massachusetts Institute of Technology. Electrical apparatus. 3,909,685, Cl. 318-139.000.

Baker, Thomas R., to Kliklok Corporation. Heat sealable carton and method of forming same. 3,908,890, Cl. 229-37.00R.

Balasubramanian, K.; and Sexton, Joe F., to Texas Instruments Incorporated. Control of AxB matrix thermal printhead. 3,909,626, Cl. 235-156.000.

Balch, Joseph C. Freezing-warming apparatus. 3,908,753, Cl. 165-39.000.

Bald, Robert E.: *See*—
Swanson, Harold V.; and Bald, Robert E., 3,909,010.

Baldassarri, Agostino; and Ferro, Walter, to Minnesota Mining and Manufacturing Company. Tetrazolium C-oxy-betaine compounds as antifog agents for silver halide photographic emulsions. 3,909,268, Cl. 96-76.00R.

Baldwin, Willett F.: *See*—
Mullins, Lynn D.; and Baldwin, Willett F., 3,908,454.

Balekjian, Sigrid F.: *See*—
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Balluff, Robert N.: *See*—
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Baltek Corporation: *See*—
Shook, Gerald D., 3,909,342.

Ban, Thomas E., to McDowell-Wellman Engineering Company. Process for conditioning sinter draft for electrostatic precipitation of particulate material therefrom. 3,909,189, Cl. 432-16.000.

Banderet, Albert: *See*—
Riess, Gerard; Periard, Jacques; and Banderet, Albert, 3,909,478.

Bankowski, Walter F., Jr.; Kumar, Vijay R.; McGovern, William; and Tartamella, John D., to International Business Machines Corporation. Multi-phase CCD shift register optical sensor with high resolution. 3,909,803, Cl. 340-173.0LS.

Banner Metals Division Intercole Automation, Inc.: *See*—
Wilson, James D., 3,909,032.

Bannister, Brian Charles, to Marler Haley Expo Systems Limited. Sectional support member. 3,908,943, Cl. 248-159.000.

Bannister, Lawrence H.: *See*—
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Banton, Calvin G.: *See*—
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Banton, Stephen G.: *See*—
Burcham, Alvin J., 3,908,630.

Banzai Jidosha Kabushiki Kaisha: *See*—
Murakami, Kunihiko; and Kaneda, Reiken, 3,908,280.

Bar-on, Ari, to Xerox Corporation. Structure for applying release agent to a heated fuser roll structure. 3,908,589, Cl. 118-60.000.

Barber, Robert E.; Nichols, Kenneth E.; and Prigmore, Daryl R., to Sperry Rand Corporation. Geothermal energy conversion system for maximum energy extraction. 3,908,381, Cl. 60-641.000.

Barchard, John: *See*—
Carroll, Henry F., 3,908,849.

Bardoni, Giacomo: *See*—
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Bardsley, Frank Baxter: *See*—
Neville, Richard Ernest Gartside; and Bardsley, Frank Baxter, 3,908,817.

Barenyi, Bela, to Daimler-Benz Aktiengesellschaft. Steering arrangement for motor vehicles. 3,908,478, Cl. 74-492.000.

Barenyi, Bela; Wilfert, Karl; and Renner, Hermann, to Daimler-Benz Aktiengesellschaft. Safety installation for the passengers of vehicles, especially of motor vehicles. 3,909,039, Cl. 280-150.00B.

Barhorst, Alphonso F. Car top drain trough clamp. 3,908,876, Cl. 224-42.10B.

Barnes, Roland O.: *See*—
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Barrett, Joseph J., to Allied Chemical Corporation. Spectroscopic temperature measurement. 3,909,132, Cl. 356-45.000.

Barrie, Ian Torrance, to Imperial Chemical Industries Limited. Injection moulding apparatus. 3,909,169, Cl. 425-130.000.

Bartlett, Robert W., to Board of Trustee of Leland Stanford Jr. University. Particle size analyzer. 3,908,465, Cl. 73-432.0PS.

Barton, George C.: *See*—
Gadd, Ronald O. C.; Payne, Sidney H.; and Barton, George C., 3,908,216.

Bartucci, John F., to Goodyear Aerospace Corporation. CRT projection lens. 3,909,523, Cl. 178-7.800.

Barty, Thomas. Hydraulic puller. 3,908,258, Cl. 29-252.000.

BASF Aktiengesellschaft: *See*—
Degner, Dieter, 3,909,376.
Friedrichsen, Wilhelm; and Goehre, Otto, 3,909,457.
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Schmid, Hans; and Feldhoff, Heinrich, 3,908,248.
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BASF Wyandotte Corporation: *See*—
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Parker, Edward T.; and Lundsted, Lester G., 3,909,345.

Bates, H. John; Louie, Albert; and Gee, John F., to Rucker Company, The. Tensioner construction. 3,908,963, Cl. 254-172.000.

Battelle Memorial Institute: *See*—
Ringrose, Anthony S., 3,908,403.

Bauer, Kunibert; and Guttinger, Manfred, to Sandco Ltd. Transducer for sensing a variation of a magnetic field on a conveyor belt. 3,909,711, Cl. 324-43.00R.

Bauerfeind, Klaus, to Motoren- und Turbinen-Union Munchen GmbH. Aero gas turbine afterburner control. 3,908,363, Cl. 60-237.000.

Baum, Joerg Peter: *See*—
Baum, Kurt; Baum, Joerg Peter; Pearce, Jai Kumar; and Schroeder, David Lee, 3,908,969.

Baum, Kurt; Baum, Joerg Peter; Pearce, Jai Kumar; and Schroeder, David Lee, to Pennsylvania Engineering Corporation. Method and apparatus for air pollution control combined with safe recovery and control of gases from a bottom-blown steel converter vessel. 3,908,969, Cl. 266-17.000.

Bauman, Dieter. Process and apparatus for cleaning exhaust fumes. 3,908,367, Cl. 60-280.000.

Baumann, Hans D. Variable resistance type throttling trim. 3,908,698, Cl. 137-625.300.

Bay, Howard W.: *See*—
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Bayer Aktiengesellschaft: *See*—
Becker, Wolf-Jurgen; Schulte, Franz-Josef; and Siemer, Klaus, 3,909,202.
Boden, Heinrich; and Ersfeld, Heinrich, 3,908,966.
Faust, Wilfried; and Westphal, Kurt, 3,909,234.
Freitag, Dieter; Rudolph, Hans; Niehaus, Clemens; and Kuchenmeister, Rolf, 3,909,495.
Wiedermann, Rolf; Blahak, Johannes; and Prager, Franz Hermann, 3,909,465.

Bazant, Vladimir: *See*—
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BBC Brown Boveri & Company Limited: *See*—
Depenbrock, Manfred, 3,909,697.
Strubin, Harald, 3,908,512.

Beach, Delore A. Dental floss holder. 3,908,677, Cl. 132-91.000.

Beach, Eugene H., to United States of America, Navy. Anti-recovery device disarming mechanism. 3,908,553, Cl. 102-70.20R.

Beagle, Robert B., to Dow Badische Company. Spindle retainer. 3,908,350, Cl. 57-77.450.

Beams, Jesse W.: *See*—
Goss, Wilbur H.; Porter, Henry H.; Roberts, Richard B.; Tuve, Merle Antony; Beams, Jesse W.; and Selvidge, Harner, 3,908,933.

Beattie, Horace S., to International Business Machines Corporation. High speed printer. 3,908,809, Cl. 197-18.000.

Beatty, Bobby D.; Herold, Stanley J.; LaGrange, Donald E.; and Sanders, David K., to United States of America, Navy. One hand operable distress signal. 3,908,550, Cl. 102-37.400.

Beaumont, Gerald P.: *See*—
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Beauside Patentverwertungs AG: *See*—
Beudat, Ande Emile, 3,908,417.

Beavon, Alfred N., to Universal-Rundle Corporation. Flame retardant reinforced bonded articles and bonding compositions therefor. 3,909,484, Cl. 260-40.00R.

Bechthold, Horst: *See*—
Rose, Fritz; Bechthold, Horst; Bieniok, Paul; and Stein, Dieter, 3,909,244.

Beck, Edward: *See*—
Bedo, Alfred; and Beck, Edward, 3,908,463.

Beck, James R., to Eli Lilly and Company. Substituted sulfanilyl sulfilimine compounds as herbicides. 3,909,235, Cl. 71-90.000.

Becker, Wolf-Jurgen; Schulte, Franz-Josef; and Siemer, Klaus, to Bayer Aktiengesellschaft; and Erdolchemie Gesellschaft mit beschrankter Haftung. Apparatus for analysis of liquids. 3,909,202, Cl. 23-253.0PC.

Beckman Instruments, Inc.: *See*—
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Becorit Grubenausbau GmbH: *See*—
Lubojatsky, Walter; and Wertelewski, Wilhelm, 3,908,389.

Becton, Dickinson and Company: *See*—
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Bedo, Alfred; and Beck, Edward, to Sno-Trik Company. Sample transfer valve. 3,908,463, Cl. 73-422.0GC.

Bedrossian, Antoine: *See*—
Nollace, Pierre; Soleil, Daniel; Chabane, Georges; and Bedrossian, Antoine, 3,909,621.

Beier, Siegfried: *See*—
Weber, Klaus; Zahn, Wolfgang; Hujer, Friedrich; and Beier, Siegfried, 3,909,171.

Beierholm, Hans Mogens, to Danfoss A/S. Blocking oscillator with energy recovery. 3,909,747, Cl. 331-112.000.

Beinssen, Hans W.: *See*—
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Bekku, Fujio: *See*—
Umehara, Ryo; and Bekku, Fujio, 3,908,410.

Bell & Howell Company: *See*—
Brodhag, Jeffrey A.; and Rehurek, Lawrence H., 3,909,686.
Raymond, William R.; and Stefansson, Rafn, 3,909,784.

Bell, John D.: *See*—
Caughlin, James Daniel; and Bell, John D., 3,909,222.

Bell, Leo A., to Martin-Decker Company. Mud weighing unit. 3,908,466, Cl. 73-45.00L.

Bell Telephone Laboratories, Incorporated: *See*—
Bobilin, Richard Thomas, 3,909,541.
Brady, Douglas MacPherson, 3,909,750.
Cox, Donald Clyde; and Reudink, Douglas Otto John, 3,909,742.
Fulton, Alan William, 3,909,807.
Marcuse, Dietrich, 3,909,110.
Rabiner, Lawrence Richard; Rosenthal, Lewis Hyman; and Schafer, Ronald William, 3,909,532.
Weber, Heinz Paul, 3,909,749.

Bellisai, Giorgio; Lemaire, Guy; and Gerard, Claude, to Burroughs Corporation. One-chain bi-directional paper mover. 3,908,883, Cl. 226-74.000.

Beloit Corporation: *See*—
Blair, Eugene R.; and Page, Robert E., 3,909,174.

Beltran, Manuel Carlos, to Fabril Automaq S.A.I.C.A.F.I. Machine for washing the under parts of vehicles in general. 3,908,907, Cl. 239-184.000.

Belttary, Harold E., to Caribe Circuit Breaker Co., Inc. Electric circuit breaker. 3,909,764, Cl. 337-75.000.

Bemmels, Cyrus W.; and Crocker, Guy J., to Johnson & Johnson. Carded package. 3,908,827, Cl. 206-478.000.

Benatti, Edmo, to Franken Fabrik fur Prazisionswerkzeuge, und Prazisionsteile Richard Voigt Nachf, Firma. Self-tightening tool chuck with a stop member adapted to be axially displaced by means of screws. 3,909,062, Cl. 279-47.000.

Bender, Hugo, to Hoechst Aktiengesellschaft. Production of bags and sacks. 3,908,522, Cl. 93-35.00R.

Bendix Corporation, The: *See*—
Peterson, A. Duane, 3,909,647.

Bengtsson, Goran Vilhelm. Filtering device. 3,909,221, Cl. 55-314.000.

Bennett, Raymond George: *See*—
Rundell, John Trethowan; Bennett, Raymond George; Rich, Colin Vesty; and Pottage, Paul Richmond, 3,909,287.

Bennett, Victor A., Jr., to JBH Electronic Systems, Inc. Variable frequency communication system. 3,909,722, Cl. 325-45.000.

Benninger, Arthur C.; and Long, Meletus I., to Ti-Brook, Inc. Floor and frame construction for flat trailers. 3,909,059, Cl. 296-28.00M.

Bentley, David R.: *See*—
Schweibold, Donald J.; and Bentley, David R., 3,908,365.

Benton, Stanley D.: *See*—
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Benz, Hans, to Brown Boveri-Sulzer Turbomachinery, Ltd. Multi-stage axial compressor. 3,909,153, Cl. 415-53.00R.

Beondu A.G.: *See*—
Schiffelers, Theodoor Gerardus Maria, 3,908,603.

Beranek, Jaroslav; Kaspar, Milos; Bazant, Vladimir; and Chladek, Antonin, to Ceskoslovenska akademie ved. Method of and apparatus for heat transfer in a fluidized bed. 3,908,284, Cl. 34-10.000.

Bereday, Sigmund: *See*—
Kolic, Edwin S.; and Bereday, Sigmund, 3,909,387.

Beretta, Paolo; and Magnani, Luigi, to Minnesota Mining and Manufacturing Company. Silver halide emulsion containing trinuclear rhodanine nucleus dyes soluble in low-molecular weight alcohols. 3,909,274, Cl. 96-127.000.

Bereza, Albert; Korner, Renzo L.; and Franke, Milton W., to Westinghouse Electric Corporation. Electrically shielded cable seal assembly and penetration combination. 3,909,500, Cl. 174-11.00R.

Berg, Leo; Lenemann, Erhard Johann; and Kinneging, Johannes Wilhelmus, to Hoechst Aktiengesellschaft. Installation for filling drums with liquid yellow phosphorus. 3,908,719, Cl. 141-82.000.

Berg Manufacturing Company, The: *See*—
Ma, James W., 3,908,520.

Bergeron, Daniel A.: *See*—
Crahan, Michael J.; and Bergeron, Daniel A., 3,908,304.

Bergische Stahl-Industrie: *See*—
Otto, Alfred; Feldhoff, Hermann Josef; Kupiek, Heinrich; and Brackelmann, Gerd, 3,908,803.

Bergstrom, Gunnar A. Doffing means for the package wound on a strand winding machine. 3,908,918, Cl. 242-18.00R.

Bernstein, Robert I. Cardiac pacer. 3,908,667, Cl. 128-419.0PG.

Bertea Corporation: *See*—
Cover, Walter E., 3,908,472.

Bertin, Ira L.: *See*—
Bertin, Mannie; and Bertin, Ira L., 3,908,528.

Bertin, Mannie; and Bertin, Ira L. Diffusers for conditioned air. 3,908,528, Cl. 98-40.0VM.

Berton, Georges A.: *See*—
Delgendre, Jacques C.; Hamon, Emile F.; and Berton, Georges A., 3,909,567.

Bertonelli, Gianni, to F B R S.r.l. Automatic machine for the processing of artichokes. 3,908,813, Cl. 198-24.000.

Bessette, Andrew Paul: *See*—
Graves, Herbert Kenneth; and Bessette, Andrew Paul, 3,909,103.

Bethlehem Steel Corporation: *See*—
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Irons, Stanton D.; and Miller, Francis G., 3,908,912.
Townsend, Herbert E., Jr.; and Krcmar, Frank, 3,909,048.

Betts, Joseph E.; and Vostovich, Joseph E., to General Electric Company. Electrical conductors with strippable polymeric materials. 3,909,507, Cl. 174-102.0SC.

Beudat, Ande Emile, to Beauside Patentverwertungs AG. Lock. 3,908,417, Cl. 70-100.000.

Beyerlein, Fritz W., to Signetics Corporation. Encapsulated integrated circuit and method. 3,909,838, Cl. 357-70.000.

Beyl, Jean Joseph Alfred. Ski binding. 3,909,030, Cl. 280-11.35T.

Bicker, Alvin: *See*—
Yoslow, Wilfred; Bicker, Alvin; and Yoslow, Mark L., 3,908,279.

Bielfeldt, Friedrich Bernd; and Schaa, Wolfgang, to Krauss-Maffei Aktiengesellschaft. Mounting and rotating assembly for the axially shiftable shaft of an injection molding machine. 3,908,968, Cl. 259-191.000.

Bieniok, Paul: *See*—
Rose, Fritz; Bechthold, Horst; Bieniok, Paul; and Stein, Dieter, 3,909,244.

Bierlich, Johannes Harald. Window assembly. 3,908,313, Cl. 49-501.000.

Billeter, Thomas R., to United States of America, Energy Research and Development Administration. Device for measuring biaxial strain. 3,909,713, Cl. 324-58.50C.

Binard, William J., to Kendall Company, The. Activating means for vented chambers. 3,908,656, Cl. 128-275.000.

Binder, Robert, to Dr. -Ing. H.c.F. Porsche Aktiengesellschaft. Pressurized lubrication circulation system for the main bearings of an internal combustion engine. 3,908,798, Cl. 184-6.500.

Bir, Wallace G., to Monsanto Company. Vertical stirred mass polymerization apparatus. 3,909,207, Cl. 23-285.000.

Bird, Joseph W., to Ralph Pill Electric Supply Company. Wiring system. 3,909,503, Cl. 174-48.000.

Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, to Hoechst Aktiengesellschaft. Process and device for the impregnation and drying of textile material. 3,909,196, Cl. 8-140.000.

Birtcher Corporation, The: *See*—
Judson, Donald William; and Tormey, Glenn Roy, Jr., 3,908,641.

Biswas, Amit Kumar; Feldmann, Hugo; Hollmann, Friedrich Wilhelm; and Bretschneider, Erich, to Schloemann-Siemag Aktiengesellschaft. Apparatus for forming material using a skew-rolling mill. 3,908,420, Cl. 72-68.000.

Bizot, Jean; and Sausse, Andre, to Rhone-Poulenc S.A. Purification of a chloride solution. 3,909,377, Cl. 204-95.000.

Bjork, Bengt Anders, to Domkraft AB Nike. Drawing table with drawing board relieved by gas spring. 3,908,944, Cl. 248-162.000.

Bjorksten, Johan A.: *See*—
Newcomb, Morton Austin; and Bjorksten, Johan A., 3,908,901.

Black Clawson Company, The: *See*—
Seifert, Peter, 3,909,400.

Black, Marion Homer. Three wheel vehicle. 3,909,043, Cl. 280-269.000.

Black, Sivalls & Bryson, Inc.: *See*—
Short, Edward H., 3,908,684.

Blacksmith, Philipp: *See*—
Newburgh, Ronald G.; Blacksmith, Philipp; and Sethares, James C., 3,909,710.

Blahak, Johannes: *See*—
Wiedermann, Rolf; Blahak, Johannes; and Prager, Franz Hermann, 3,909,465.

Blair, Eugene R.; and Page, Robert E., to Beloit Corporation. Continuous tube forming by melt blowing technique. 3,909,174, Cl. 425-224.000.

Blank, Zvi: *See*—
Neinart, Louis F.; Linares, Robert C.; Jeges, Paul; and Blank, Zvi, 3,908,644.

Blaschke, Felix; and Dreiseitl, Walter, to Siemens Aktiengesellschaft. Method and apparatus for determining the initial rotor angle in a rotating field machine. 3,909,688, Cl. 318-227.000.

Blatnica, Joseph R. Welded pipe flange. 3,909,049, Cl. 285-329.000.

Bleau, Charles Dale, to International Business Machines Corporation. Sheet aligning mechanism. 3,908,986, Cl. 271-227.000.

Bledsoe Corporation: *See*—
Bledsoe, William E., Jr., 3,908,947.

Bledsoe, William E., Jr., to Bledsoe Corporation. Standard for a sign. 3,908,947, Cl. 248-188.700.

Bleiche A.G.: *See*—
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Bliss & Laughlin Ind., Inc.: *See*—
Schrepferman, John R., 3,908,884.

Bliss, Russell Clark. Adjustable limb support. 3,908,643, Cl. 128-83.000.

Blohm and Voss AG: *See*—
Krakow, Heinz, 3,909,580.

Bloom, Stanley M., to Polaroid Corporation. Dye developer processes and products using naphth[1,2-d]imidazole. 3,909,264, Cl. 96-3.000.

Blum, Josef, to Du Pont de Nemours, E. I., and Company. Apparatus for producing glass knives for microtomes and the like. 3,908,878, Cl. 225-96.500.

Blurton, Leon C.; and Cina, Saverio J., to Global Marine Inc. Air cushion drilling vehicle. 3,908,784, Cl. 180-119.000.

Board of Trustee of Leland Stanford Jr. University: *See*—
Bartlett, Robert W., 3,908,465.

Bobard, Emile, to Jeune, Bobard. Coupling means for tractors. 3,908,774, Cl. 180-1.00F.

Bobier, Wilfred S., to Oilgear Company, The. Fluid device having constant horsepower displacement control means. 3,908,518, Cl. 91-506.000.

Bobilin, Richard Thomas, to Bell Telephone Laboratories, Incorporated. Low-speed framing arrangement for a high-speed digital bitstream. 3,909,541, Cl. 179-15.0BS.

Boden, Heinrich; and Ersfeld, Heinrich, to Bayer Aktiengesellschaft. Mixing apparatus. 3,908,966, Cl. 259-4.000.

Boehringer, John R. Controlled positive end pressure expiratory device. 3,908,987, Cl. 272-57.00F.

Boehringer Mannheim G.m.b.H.: *See*—
Reinhard, Ernst; Boy, Hans-Martin; Stach, Kurt; Kaiser, Fritz; and Lubs, Hans Joachim, 3,909,357.

Boeing Company, The: *See*—
Demetrick, Roy W., 3,908,683.
Majeau, Henrie L.; Barnes, Roland O.; Hove, Robert G.; and Angell, Abraham L., Jr., 3,909,534.

Bohlin, Gunnar Karl; and Eriksson, Rune Karl, to SCA Development Aktiebolag. Measuring device. 3,908,772, Cl. 177-17.000.

Boise Cascade Corporation: *See*—
Lambuth, Alan L.; and Hearon, William Montgomery, 3,909,470.

Bolduc, Lee R., to Medtronic, Inc. Tissue stimulator with sealed lead connector. 3,908,668, Cl. 128-419.00P.

Bolen, Robert J., to Remington Arms Company, Inc. Cartridge case trimming machine. 3,908,253, Cl. 29-1.320.

Bolin, Gustav Georg Arne. Device in stringed musical instruments. 3,908,503, Cl. 84-1.160.

Bolker, Henry I.: *See*—
Liebergott, Norman; and Bolker, Henry I., 3,909,194.

Bollyky, Laszlo Joseph; and Whitman, Robert Henry, to American Cyanamid Company. Chemiluminescence from o-oxalylhydroxyl amine compounds. 3,909,440, Cl. 252-188.300.

Bolt, Alex W. Materials handling equipment more particularly a combination cylindrical pipe handle and hoist mounting device. 3,908,845, Cl. 214-147.00R.

Bomford, Michael James, to International Nickel Company, Inc., The. Post working of mechanically alloyed products. 3,909,309, Cl. 148-11.50F.

Bondi, George A.: *See*—
Shapiro, Herbert D.; and Bondi, George A., 3,908,945.

Bonisch, Herbert; and Geier, Bernd, to Daimler-Benz Aktiengesellschaft. Armrest in a motor vehicle. 3,909,063, Cl. 297-113.000.

Bonnaure, Edouard, to Creusot-Loire Entreprises. Installation for treatment of minerals on a continuous circular grill. 3,908,972, Cl. 266-20.000.

Bonus Bilt, Inc.: *See*—
Wittschen, Royal C., 3,908,562.

Booth, Thomas Allan, to Addressograph Multigraph Corporation. Optical device for converting a phototypesetter into headliner operation. 3,909,832, Cl. 354-5.000.

Borchert, Alfred E.; Condo, Albert C.; Gzemski, Felix C.; McGrogan, John F.; and Wilbur, Benjamin C., to Atlantic Richfield Company. Road surface stabilization. 3,909,474, Cl. 260-28.000.

Bore, Pierre; Arnaud, Jean-Claude; and Kalopissis, Gregoire, to Societe Anonyme dite: L'Oreal. Novel process for improving and modifying the properties of hair. 3,908,672, Cl. 132-7.000.

Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, to Institut Francais du Petrole des Carburants et Lubrifiants. Apparatus for hydrocarbon conversion. 3,909,208, Cl. 23-288.00R.

Born, Ellis H.; Viles, Alan H.; Adams, Cecil E.; and Thurston, David L., to Abex Corporation. Control systems for a variable displacement pump. 3,908,519, Cl. 92-12.200.

Boroffka, Hartmut; Krimmel, Eberhard; and Runge, Hartmut, to Siemens Aktiengesellschaft. Ion implantation process. 3,909,305, Cl. 148-1.500.

Bosch, Julius, to Frieseke & Hoepfner GmbH. Apparatus for measuring the surface density of a web. 3,909,615, Cl. 250-358.000.

Bothe, Werner, to Maschinenfabrik Hasenclever GmbH. Power press with overload protection. 3,908,436, Cl. 72-431.000.

Botsolas, Chris J., to Johns-Manville Corporation. Insulating cover with open pyramidal passageway projections. 3,908,705, Cl. 138-149.000.

Bottone, Arthur A.; and Rainone, Nicholas J., to Westinghouse Electric Corporation. Compact electric incandescent lamp having planar filament and improved mount. 3,909,653, Cl. 313-271.000.

Bournazel, Claude; Chatard, Michel; and Grolet, Pierre, to Institut Francais du Petrole, des Carburants et Lubrifiants. Armoured flexible pipe structure. 3,908,703, Cl. 138-120.000.

Boutin, Charles U.: *See*—
Laakmann, Peter; and Boutin, Charles U., 3,909,668.

Bowen, William Edmund, to American Can Company. Method of forming a line of weakness in a multilayer laminate. 3,909,582, Cl. 219-121.0LM.

Bower, Allen M., to Emco Wheaton Inc. Vapour recovery systems of liquid fuel storage. 3,908,718, Cl. 141-59.000.

Bowman, Miles Augustus, Jr.; Hampton, Christopher James; and Schock, Paul Henry, to Dana Corporation. Edge bending press. 3,908,435, Cl. 72-411.000.

Boy, Hans-Martin: *See*—
Reinhard, Ernst; Boy, Hans-Martin; Stach, Kurt; Kaiser, Fritz; and Lubs, Hans Joachim, 3,909,357.

Boycott, William A., to Oxy Metal Industries Corporation. Composition and process for electrodepositing a black chromium deposit. 3,909,404, Cl. 204-43.00R.

Boyd, John A. Jam-proof trash compactor. 3,908,538, Cl. 100-49.000.

Brackelmann, Gerd: *See*—
Otto, Alfred; Feldhoff, Hermann Josef; Kupiek, Heinrich; and Brackelmann, Gerd, 3,908,803.

Bradatsch, Edmund: *See*—
Lau, Gunther; Bradatsch, Edmund; and Brandl, Hermann J., 3,908,587.

Braddock, Walter B., to American Microsystems, Inc. Low power gate switching device for triacs. 3,909,703, Cl. 323-19.000.

Bradway, Gary C.: *See*—
Roy, Joseph A.; and Bradway, Gary C., 3,908,251.

Brady, Douglas MacPherson, to Bell Telephone Laboratories, Incorporated. Apparatus for encoding a binary signal into a frequency modulated coherent phase-shift keyed signal. 3,909,750, Cl. 332-9.00R.

Brain, Douglas Harold, to J. & P. Coats Limited. Conveyor device. 3,908,816, Cl. 198-41.000.

Brand, Abel L.; and Hubbard, Robert L., to Americal Corporation. Ladies knee-high stocking with supporting cuff. 3,908,407, Cl. 66-172.00E.

Brandl, Hermann J.: *See*—
Lau, Gunther; Bradatsch, Edmund; and Brandl, Hermann J., 3,908,587.

Brannan, Leonard M. Apparatus and method for depositing particulate matter beneath the surface of soil. 3,908,567, Cl. 111-7.000.

Braunberger, Benjamin A., to GEHL Company. Articulated vehicle assembly. 3,908,398, Cl. 64-6.000.

Brazer, Geoffrey R.; Curran, Patrick M.; and Terkelsen, Bruce E., to United Technologies Corporation. Method and apparatus for control of alloy in columnar grain castings. 3,908,733, Cl. 164-60.000.

Breckner, Gerald; Terlecki, Leo; Goulish, Gabriel; and Costello, James, to GF Business Equipment, Inc. Office appliance. 3,909,090, Cl. 312-217.000.

Brecy, Andre Achille: *See*—
Palombo, Gaston Albert; and Brecy, Andre Achille, 3,909,734.

Brendgord, Thomas, to American Sterilizer Company. Modular storage system. 3,908,831, Cl. 211-88.000.

Breslow, Jeffery D.; and Jaworski, Eugene, to Marvin Glass & Associates. Target game. 3,908,997, Cl. 273-119.00A.

Breslow, Jeffrey D.: *See*—
McKay, Robert S.; Breslow, Jeffrey D.; and Glass, Marvin I., 3,908,303.

Bretschneider, Erich: *See*—
Biswas, Amit Kumar; Feldmann, Hugo; Hollmann, Friedrich Wilhelm; and Bretschneider, Erich, 3,908,420.

Brewer, Willie F., to Hagie Manufacturing Company. Refuse collecting and dispensing vehicle. 3,908,848, Cl. 214-508.000.

Bricker, Robert E.: *See*—
Price, Ralph E.; and Bricker, Robert E., 3,908,627.

Bridgestone Tire Company Limited: *See*—
Takahashi, Shoji; and Yabe, Toshinori, 3,909,336.
Yabe, Toshinori, 3,909,337.

Brienza, Michael J.; and Smith, David C., to United Technologies Corporation. Method and apparatus for dynamically balancing a rotatable object. 3,909,584, Cl. 219-121.0LM.

Briles, Franklin S. Go, No-go rivet gun. 3,908,257, Cl. 29-243.540.

British Gas Corporation: *See*—
Allen, John Douglas, 3,909,204.

British Industrial Plastics Limited: *See*—
Collins, George Thomas, 3,909,172.

British Iron and Steel Research Association, The: *See*—
English, Paul Everitt; Ashcroft, Ian Reginald; Norris, Paul Alfred; Salter, Frank Michael; Laws, William Robert; and McChesney, Herbert Raymond, 3,908,459.

British Steel Corporation: *See*—
Verdon, David Charles; and Woodhouse, Victor, 3,908,445.

Brock, William L. Seam skate for carpets. 3,908,198, Cl. 2-24.000.

Brockmuller, Friedrich Franz; and Feldkamper, Richard, to Windmoller & Holscher. Apparatus for forming loose packets of flat workpieces. 3,908,527, Cl. 93-93.0DP.

Brodhag, Jeffrey A.; and Rehurek, Lawrence H., to Bell & Howell Company. Motor control system with exponential reference source for maintaining a constant lineal speed of a film being wound on a reel. 3,909,686, Cl. 318-163.000.

Broding, Robert A.; and Landrum, Ralph A., Jr., to Amoco Production Company. Fluidic oscillator seismic source. 3,909,776, Cl. 340-17.000.

Broes, Frank, to Stradler Ship Company. Ship structure. 3,908,573, Cl. 114-43.5VC.

Broman, Harold L., to Sno Pac Corporation. Mobile compacting apparatus. 3,908,540, Cl. 100-215.000.

Broman, Victor E.: *See—*
Turnquest, Byron W.; Chao, Tai S.; and Broman, Victor E., 3,909,420.

Bromley, Thomas D.; and Stark, Marvin L., to Dover Corporation. Motor attachment assembly. 3,908,941, Cl. 248-23.000.

Bronner, Charles: *See—*
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 3,909,208.

Bronson, Nathaniel R., II: *See—*
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Brooks, Joseph F.; and Meyer, Robert B., to National Union Electric Corporation. Cleaning nozzle attachment for a suction cleaner. 3,908,223, Cl. 15-383.000.

Brotzmann, Karl; and Fassbinder, Hans Georg, to Eisenwerk-Gesellschaft Maximilianshutte mbH. Process for lowering the iron content in nickel melts. 3,909,245, Cl. 75-60.000.

Brouns, Austin J.: *See—*
Morrow, Charles T.; and Brouns, Austin J., 3,909,529.

Brown, Boveri & Cie Aktiengesellschaft: *See—*
Nill, Reiner, 3,909,698.

Brown Boveri-Sulzer Turbomachinery, Ltd.: *See—*
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Brown, Cecil, Jr. Teaching device. 3,908,288, Cl. 35-35.00C.

Brown, Donald E. Modified chess game apparatus. 3,908,999, Cl. 273-131.0KC.

Brown, Felix H., to Owens-Illinois, Inc. Photon conditioning of gaseous discharge display panel including phosphor means emitting UV radiation. 3,909,657, Cl. 313-487.000.

Brown, Frank R. Wire-holding attachment for wire-clippers. 3,908,268, Cl. 30-124.000.

Brown, George A.: *See—*
Goffe, William L.; and Brown, George A., 3,909,262.

Brown, Merritt J. Fluids mixing and proportioning device. 3,908,866, Cl. 222-135.000.

Brown, Paul L., to Dow Corning Corporation. Phenoxy organosilicon compounds as dielectric fluids. 3,909,434, Cl. 252-63.700.

Brown, Robert F., Jr.: *See—*
Trott, Wayne B., Jr.; and Brown, Robert F., Jr., 3,909,599.

Brown & Williamson Tobacco Corporation: *See—*
Cogbill, Philip Hancock, II, 3,908,671.

Brownbill, Thomas Duncan, to John Dale Limited. High energy forming. 3,908,419, Cl. 72-56.000.

Browne, Sidney, to Carrier Telephone Corporation of America, Inc. Ruggedized package for electronic components and the like. 3,909,504, Cl. 174-52.0PE.

Bruels, John F. Wall plate for flexible conduit. 3,909,101, Cl. 339-107.000.

Brulfert, Andre; and Hoss, Andre-Gabriel. Steam or hot water generator using the catalytic combustion of hydrocarbons. 3,908,602, Cl. 122-4.00D.

Brummitt, Roger. Bale handling apparatus. 3,908,846, Cl. 214-147.00G.

Bruni, Aldo: *See—*
Campari, Luigi; and Bruni, Aldo, 3,909,506.

Brunk, Klaus: *See—*
Kramer, Friedhelm; and Brunk, Klaus, 3,909,058.

Bruzas, John A.; and Coville, William E., to Gould Inc. Method of positive displacement bonding of battery components. 3,908,738, Cl. 164-80.000.

Bruzas, John A.: *See—*
Schenk, Raymond L., Jr.; and Bruzas, John A., 3,908,743.

Bryant, Donald R. Construction apparatus. 3,908,975, Cl. 269-40.000.

Bryant, Robert G., to Gem Industries, Inc. Apertured gate shoe for crib drop sides. 3,908,211, Cl. 5-100.000.

Brzozowski, Stephen Joseph, to International Telephone and Telegraph Corporation. Lamp socket for use with printed circuits and the like. 3,909,096, Cl. 339-17.00D.

Bucalo, Louis, to Investors In Ventures, Inc. Method for testing body fluids such as semen. 3,909,363, Cl. 195-103.50R.

Buchanan, James R.: *See—*
Gauge, Thomas P.; Kocsis, Joseph; and Buchanan, James R., 3,909,320.

Buelk, Eggert, to Rockwell International Corporation. Exhaust systems for aquatic craft. 3,908,578, Cl. 115-6.100.

Buhler, Rato, to Applied Fiberoptics Incorporated. Inclined prism ocular systems for stereomicroscope. 3,909,106, Cl. 350-35.000.

Buhrke, Rolfe E.: *See—*
Chang, Gregory I.; Buhrke, Rolfe E.; Schulte, Donald L.; and Wilber, John A., 3,909,795.

Bunda, Tsuchio: *See—*
Toyoda, Eiji; Noguchi, Masaaki; Tanaka, Yukiyasu; Bunda, Tsuchio; and Sumiyoshi, Masaharu, 3,908,606.

Bunker Ramo Corporation, The: *See—*
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Burcham, Alvin J., to Banton, Calvin G.; and Banton, Stephen G. Fireplace damper cone. 3,908,630, Cl. 126-120.000.

Burnett, John W. Transportable overbed table. 3,908,565, Cl. 108-147.000.

Burns, Richard W.: *See—*
Tang, Raymond; Burns, Richard W.; and Holden, Russell L., 3,909,751.

Burns, Samuel L., Jr. Snow making apparatus and method. 3,908,903, Cl. 239-2.00S.

Burroughs Corporation: *See—*
Bellisai, Giorgio; Lemaire, Guy; and Gerard, Claude, 3,908,883.

Burroughs Wellcome Co.: *See—*
Porcher, Alain; and Lefevre, Edouard, 3,908,638.

Burrow, Norman George, to U.S. Philips Corporation. Acoustic surface wave device. 3,909,753, Cl. 333-72.000.

Burtnyk, Victor: *See—*
Lundquist, Thomas G.; and Burtnyk, Victor, 3,909,672.

Burton, Keith F.; and Wenbourne, Alan E. G., to Twin Disc, Incorporated. Timing valve for multipiston hydrostatic engines. 3,908,516, Cl. 91-476.000.

Bush, Thomas P., Jr.; and Grant, Samuel Edward. Log processing machine. 3,908,495, Cl. 83-112.000.

Busian, Vincent V., to General Electric Company. Dynamoelectric machine. 3,909,642, Cl. 310-42.000.

Busket, Leroy H., to Nakajima All Co., Ltd. Ultrasonic calendering of paper webs. 3,908,808, Cl. 100-35.000.

Bussen, Michael Robert; and Schurter, Gary Lee, to International Telephone and Telegraph Corporation. Linear motion snap-action mechanism. 3,908,473, Cl. 74-100.00R.

Bussgang, Julian J.; and Gish, Herbert, to Signatron, Inc. Signal processing system. 3,909,721, Cl. 325-41.000.

Buthe, Fritz, to Johannes Menschner Textilmaschinenfabrik, Firma. Carpet shearing machine. 3,908,245, Cl. 26-15.00R.

Butler, L. Dennis: *See—*
Furtado, Anthony E.; Wadsworth, Thomas H.; and Butler, L. Dennis, 3,908,833.

Byers, Warren J.: *See—*
Kleine, Richard A.; Byers, Warren J.; and Wright, Charles A., 3,908,791.

Byrne Doors, Inc.: *See—*
Davidson, Charles S., 3,908,310.

Byron Jackson Inc.: *See—*
Merritt, Clyde H., 3,908,967.

Cabot Corporation: *See—*
Economou, Peter; Hardy, John F.; and Renner, Alfred, 3,909,348.

Cagle, William S.; and Dillard, Fred H., to Standard Oil Company. Sidetracking tool. 3,908,759, Cl. 166-117.600.

Cain, James F., to Marlboro Manufacturing Inc. Hinge structure. 3,908,227, Cl. 16-137.000.

Cairns, David W.: *See—*
George, Harvey F.; Oppenheimer, Robert H.; Marrara, Charles G.; and Cairns, David W., 3,909,138.

Cairns, James W., to Garlock Inc. Composite bearings. 3,909,087, Cl. 308-238.000.

Calderon, Reynaldo: *See—*
Umphenour, Charles F.; and Calderon, Reynaldo, 3,908,699.

Caldwell, Edward N., to Robertshaw Controls Company. Pneumatically operated control device and parts therefor or the like. 3,908,685, Cl. 137-84.000.

Caldwell, Thomas W.; and Garini, Richard A., to NL Industries, Inc. Method and means for producing filaments of uniform configuration. 3,908,745, Cl. 164-87.000.

California Institute of Technology: *See—*
Micka, Ernest Z., 3,909,602.

Callander, Douglas D., to Goodyear Tire & Rubber Company, The. Polyesters and copolyesters having improved flame retardancy. 3,909,489, Cl. 260-45.70R.

Cameron, Frank L.; and Staney, John W., to Westinghouse Electric Corporation. Current limiting fuse element. 3,909,766, Cl. 337-159.000.

Camisa, Raymond Louis: *See—*
Yuan, Shui; and Camisa, Raymond Louis, 3,909,748.

Campari, Alfredo; and Vigini, Giorgio, to Honeywell Information Systems Italia. Driving circuit for printing electromagnet. 3,909,681, Cl. 317-148.50R.

Campari, Luigi; and Bruni, Aldo, to AMP Incorporated. Coxial cable connector and method therefor. 3,909,506, Cl. 174-88.00C.

Campbell, Donn V., to United States of America, Army. Tactical high frequency antenna. 3,909,830, Cl. 343-703.000.

Campbell, James Leroy: *See—*
Noller, Fred W.; and Campbell, James Leroy, 3,908,843.

Canadian Patents and Development Limited: *See—*
Kinsner, Witold; and Torre, Edward Della, 3,909,809.

Canney, Robert S.: *See—*
Ouellette, Ronald J.; Canney, Robert S.; and Stetson, Ralph B., 3,909,759.

Canon Kabushiki Kaisha: *See—*
Inoue, Eiichi; and Shimizu, Isamu, 3,909,266.
Ito, Tadashi; and Ito, Fumio, 3,909,835.
Kano, Ichiro, 3,909,115.
Sanada, Noriaki; and Okuno, Youichi, 3,909,834.
Sorimachi, Kanehiro; Yamamichi, Masayoshi; Ito, Tadashi; and Nakamoto, Soichi, 3,909,833.

Capitol Products: *See—*
Goss, Lorane C., Jr.; Cribben, James T.; and Miller, Joseph J., 3,908,730.

Capper, Max V. Container for bulk liquids such as milk. 3,908,864, Cl. 222-105.000.

Caribe Circuit Breaker Co., Inc.: *See—*
Belttary, Harold E., 3,909,764.

Carl Schenck AG, Firma: *See—*
Zuber, Guenter, 3,908,449.

Carminati, Julien. Machine for screwing the nuts of wheel-spokes. 3,908,729, Cl. 157-1.500.

Carpenter, Norman F.: *See—*
Alexander, George B.; and Carpenter, Norman F., 3,909,437.

Carr, Peter, to Energy Development Associates. Batteries comprising vented electrodes and method of using same. 3,909,298, Cl. 136-86.00A.

Carr, Richard V., to Velsicol Chemical Corporation. Roach trap. 3,908,302, Cl. 43-121.000.

Carr, Uriah H. Hair shaping apparatus. 3,908,673, Cl. 132-9.000.

Carrier Corporation: *See—*
Robb, Raymond R.; Hewitt, Donald C.; Walter, Melvin G., Jr.; and Sood, Vijay K., 3,909,154.

Carrier Telephone Corporation of America, Inc.: *See—*
Browne, Sidney, 3,909,504.

Carroll, Henry F., to Barchard, John, a part interest. Self propelled unloader. 3,908,849, Cl. 214-672.000.

Carroll, Thomas D., to PPG Industries, Inc. Novel tire cord forming process. 3,908,351, Cl. 57-162.000.

Carter, J. Warne; and Carter, J. Warne, Jr. Pressure control for variable pressure monotube boiler. 3,908,686, Cl. 137-94.000.

Carter, J. Warne, Jr.: *See—*
Carter, J. Warne; and Carter, J. Warne, Jr., 3,908,686.

Carter, Sidney T., to A-T-O Inc. Speed control for labeling machines. 3,908,815, Cl. 198-37.000.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 3,909,783.

Cassany, Jean Louis Roger: *See—*
Margala, Jean Pierre; and Cassany, Jean Louis Roger, 3,909,743.

Cassarino, Frank V., Jr.; and Pinheiro, Edwin J., to Honeywell Information Systems Inc. Diagnostic maintenance and test apparatus. 3,909,802, Cl. 340-172.500.

Cassarino, Frank V., Jr.: *See—*
Recks, John A.; Cassarino, Frank V., Jr.; Getson, Edward F., Jr.; Laubscher, Karl F.; McLaughlin, Albert T.; and Pinheiro, Edwin J., 3,909,799.

Castoldi, Giuseppe: *See—*
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Caterpillar Tractor Company: *See—*
Cochran, Thomas E., 3,908,804.
Habiger, Cyril W., 3,908,374.
Johnson, Howard L., 3,908,515.

Caughlin, James Daniel; and Bell, John D. Waste collection apparatus. 3,909,222, Cl. 55-317.000.

Cavanna, Mario. Device for registering articles and package elements therefor during feed to a packaging machine. 3,908,333, Cl. 53-51.000.

Caveney, Jack E.; and Moody, Roy A., to Panduit Corporation. Releasable one-piece cable tie. 3,908,233, Cl. 24-16.0PB.

CCL Systems Limited: *See—*
Surr, Eric Thornton, 3,909,142.

CEM Corporation: *See—*
Collins, Michael John; Cruse, Bernard William, Jr.; and Goetchius, Ronald James, 3,909,598.

Central Welding Supply Co.: *See—*
Sanders, Harold D.; and Landreth, Thomas C., 3,909,585.

Centre National de Transfusion Sanguine: *See—*
Matte, Claude; and Gener, Jean-Jacques, 3,908,716.
Matte, Claude, 3,909,201.

Century, Bernard A., to Allied Steel & Tractor Products, Incorporated. Hydraulic vibratory compactor. 3,909,149, Cl. 404-133.000.

Cerberus AG: *See—*
Scheidweiler, Andreas; and Thalmann, Hanspeter, 3,909,813.
Schutt, Klaus, 3,908,957.

Ceskoslovenska akademie ved: *See—*
Beranek, Jaroslav; Kaspar, Milos; Bazant, Vladimir; and Chladek, Antonin, 3,908,284.

Chabane, Georges: *See—*
Nollace, Pierre; Soleil, Daniel; Chabane, Georges; and Bedrossian, Antoine, 3,909,621.

Chadwick, Peter, to Ferranti, Limited. Frequency ratio indicating circuit arrangements. 3,909,707, Cl. 324-161.000.

Chambers, Richard E.: *See—*
Ayer, Francois N.; Cotter, Richard B.; and Chambers, Richard E., 3,909,145.

Champion Company, The: *See—*
Hannahan, William F., 3,908,246.

Champlin, Keith S. Electronic battery testing device. 3,909,708, Cl. 324-29.500.

Chandler Evans Inc.: *See—*
Meyer, Gene A.; and Jenkins, John S., 3,908,360.

Chandra, Rangasami Sarat; and Stone, Kirby Lee, to Cincinnati Milacron, Inc. Ratio controlled mixing of liquids. 3,908,862, Cl. 222-63.000.

Chang, Gregory I.; Buhrke, Rolfe E.; Schulte, Donald L.; and Wilber, John A., to GTE Automatic Electric Laboratories Incorporated. Program timing circuitry for central data processor of digital communications system. 3,909,795, Cl. 340-172.500.

Chang, Marguerite S.; Whitman, Charles L.; Haiss, Hermann S.; and Highby, John H., to United States of America, Navy. Solid gas generating and gun propellant compositions containing a nitroaminotetrazole salt. 3,909,322, Cl. 149-19.400.

Chao, Tai S.: *See—*
DeVries, Donald L.; Chao, Tai S.; and Vitchus, Bernard C., 3,909,428.
Turnquest, Byron W.; Chao, Tai S.; and Broman, Victor E., 3,909,420.

Chapell, Harry F., to Sage Laboratories, Inc. Waveguide bandstop filter. 3,909,754, Cl. 333-73.00W.

Chaplain, Jacques, to Societe Industrielle Gaillon-Armoryl "ARMOSIG". Sealing joint for pipes. 3,909,018, Cl. 277-206.00A.

Chaplin, Gary Edward: *See—*
Telliard, Gregory Alan; Hamilton, David Michael; and Chaplin, Gary Edward, 3,908,235.

Chapman, Drexel W. Method for pumpin paraffine base crude oil. 3,908,763, Cl. 166-302.000.

Chapman, Paul W.; Graves, Richard M.; and Sasse, Henry C., III. Walk about washing apparatus. 3,908,219, Cl. 15-21.00D.

Chas. O. Larson Co.: *See—*
Larson, Charles O., 3,908,949.

Chase, Ascher, to General Foam Plastics Corporation. Thermoformed wading pool with integral slide and hand rail. 3,908,205, Cl. 4-172.000.

Chatard, Michel: *See—*
Bournazel, Claude; Chatard, Michel; and Grolet, Pierre, 3,908,703.

Chemetron Corporation: *See—*
Bajcar, Miles S., 3,908,536.
Bajcar, Miles S.; Marshall, Robert H.; and Allen, William M., 3,908,537.

Chen, Calvin H.: *See—*
Man, Pang L.; Chen, Calvin H.; and Donofrio, William T., 3,908,669.

Cheney, Richard F.; Mower, Frederick J.; and Moscatello, Charles L., to GTE Sylvania Incorporated. Process for producing free flowing powder and product. 3,909,241, Cl. 75-.5BB.

Chesney, John: *See—*
Friberg, Vincent P.; and Chesney, John, 3,908,264.

Chess, Samuel: *See—*
Anorga, Carlos J.; and Chess, Samuel, 3,909,464.

Chevrolet, Gerard: *See—*
Courvoisier, Guy; Comte, Pierre; and Chevrolet, Gerard, 3,909,028.

Chevron Research Company: *See—*
Cleveland, James D., 3,909,237.
Hotten, Bruce W., 3,909,430.
Kray, Louis R., 3,909,215.

Chiappe, Wayne T., to Continental Can Company, Inc. Tape seal for container. 3,908,857, Cl. 220-359.000.

Chicago Bridge & Iron Company: *See—*
Lange, Kenneth Wilson; and Maher, James Bernard, 3,909,409.
Miller, Clarence D.; and Johnson, Paul R., 3,908,574.
Vaughn, John Edward; and Dixon, William Bradley, 3,908,793.

Childers, Grady P.: *See—*
Agan, Ernest W., Jr.; Childers, Grady P.; Frost, Walter Wade; and Hunter, John P., Jr., 3,908,250.

Chisso Corporation: *See—*
Koga, Isao; Fukui, Masahiro; Okamoto, Takehiko; Shimada, Masaru; and Nakamura, Taizo, 3,909,435.

Chladek, Antonin: *See—*
Beranek, Jaroslav; Kaspar, Milos; Bazant, Vladimir; and Chladek, Antonin, 3,908,284.

Chmiel, Horst. Apparatus for measuring rheological values of substances capable of flowing. 3,908,442, Cl. 73-55.000.

Cho, Kon Ho, to Western Electric Company, Incorporated. Method of doping a semiconductor body. 3,909,304, Cl. 148-1.500.

Christena, Ray C., to Vulcan Materials Company. Production of chlorinated phenols of improved color. 3,909,365, Cl. 203-6.000.

Christenot, Fred A.; and Cloyd, Wallace W. Implant denture framework. 3,908,269, Cl. 32-10.09A.

Chromalloy American Corporation: *See—*
Wachtell, Richard L.; and Palmenberg, Edward C., 3,909,157.

Chrysler Corporation: *See—*
Snyder, George D., 3,909,779.

Chujoo, Yasuaki; and Miyaji, Jisaku, to Funabashi Kasei Co., Ltd. Biaxially rotational synthetic resin molding machine. 3,909,179, Cl. 425-429.000.

Church, Clyde L.; and Smith, James W., II, to Motorola, Inc. Polycrystalline etch. 3,909,325, Cl. 156-17.000.

Ciba-Geigy AG: *See—*
Duennenberger, Max; and Schellenbaum, Max, 3,909,436.
Economou, Peter; Hardy, John F.; and Renner, Alfred, 3,909,348.
Toepfl, Rosemarie; Abel, Heinz; and Maeder, Arthur, 3,909,494.

Ciba-Geigy Corporation: *See—*
McGuigan, Brian; Dellar, Richard John; and Phillips, William David, 3,909,448.

Cina, Saverio J.: *See—*
Blurton, Leon C.; and Cina, Saverio J., 3,908,784.

Cincinnati Milacron, Inc.: *See—*
Chandra, Rangasami Sarat; and Stone, Kirby Lee, 3,908,862.

Hohn, Richard Edward, 3,909,600.
Circle Machine Co., Inc.: *See—*
Ordway, Richard S.; Quinn, Richard E.; and Comeau, George O., 3,908,592.
Tracy, Robert W.; and Cushing, Richard D., 3,908,724.
Clampitt, Richard L.; and Hessert, James E., to Phillips Petroleum Company. Method of treating subterranean formations with aqueous gels. 3,908,760, Cl. 166-246.000.
Clampitt, Richard L.: *See—*
Hessert, James E.; and Clampitt, Richard L., 3,909,423.
Clark Automation, Inc.: *See—*
Follrath, Richard D.; Martin, Charles W.; Race, Russell L.; and McPherson, Gerald, 3,908,746.
Clark Equipment Company: *See—*
McAdams, Paul F., 3,908,369.
Visser, Peter J., 3,909,040.
Witt, Kenneth C., 3,908,368.
Clark, Harold A., to Dow Corning Corporation. Lubricant compositions. 3,909,424, Cl. 252-12.000.
Clark, Norman D., to A. O. Smith Corporation. Electric motor having a winding insulating barrier and method of construction. 3,909,648, Cl. 310-260.000.
Claxton, Gerald L., to Upright, Inc. Cable suspension for harvesting machine. 3,909,022, Cl. 280-6.00H.
Clayton & Lambert Manufacturing Company: *See—*
Lambert, Charles F., Jr., 3,908,840.
Clemens, Jon Kaufmann, to RCA Corporation. Disc records with groove bottom depth variations. 3,909,517, Cl. 178-6.60A.
Clement, Ira T.; and McCaw, Walter J., to Penntube Plastics Company. Corrugated tubing. 3,908,704, Cl. 138-21.000.
Cleveland, James D., to Chevron Research Company. Herbicidal N-substituted-dithioamino and N-substituted-oxythioamino triazines. 3,909,237, Cl. 71-93.000.
Clorfeine, Alvin Seymour, to RCA Corporation. Lumped element, broad-band microwave apparatus using semiconductor diodes operating in the trapatt mode. 3,909,740, Cl. 330-34.000.
Cloud, Charles E.; and Hartman, Donn Allan, to R. A. Jones & Co. Inc. Method and apparatus for forming packages. 3,908,979, Cl. 270-86.000.
Clouser, Michael T.; and Shell, Bruce W., to P. R. Mallory & Co., Inc. Automatic timer switch. 3,909,565, Cl. 200-38.00R.
Cloyd, Wallace W.: *See—*
Christenot, Fred A.; and Cloyd, Wallace W., 3,908,269.
Cochran, Thomas E., to Caterpillar Tractor Company. Service and parking brake actuation piston with adjuster mechanism. 3,908,804, Cl. 188-170.000.
Cochran, William Hugh; Heuer, Dale Arthur; and Sheehan, Michael James, to International Business Machines Corporation. Minimum pitch mosfet decoder circuit configuration. 3,909,808, Cl. 340-173.00R.
Cockcroft, Frederick Edward, to Hepworth & Grandage Limited. Pistons for internal combustion engines or for compressors. 3,908,521, Cl. 92-228.000.
Cogbill, Philip Hancock, II, to Brown & Williamson Tobacco Corporation. Thermoplastic cigarette wrapper. 3,908,671, Cl. 131-15.00R.
Cohen, Morton. Method of window foiling precut geometric patterns in a burglar alarm system. 3,909,331, Cl. 156-253.000.
Coldrey, Peter Wallace; and Glen, John Barrington, to ICI Australia Limited. Process of selectively recovering nickel and cobalt. 3,909,249, Cl. 75-119.000.
Cole, Eli Wm. Bicycle improvement through provision of an automatic transmission. 3,908,474, Cl. 74-117.000.
Cole, Roger A.; and Skinner, Nathan L., to Hughes Aircraft Company. Process for removing impurities from zone refined materials. 3,909,246, Cl. 75-65.0ZM.
Coleman, William E.; and Janning, John L., to NCR Corporation. Two plate visual display device. 3,909,825, Cl. 340-366.00R.
Colgate-Palmolive Company: *See—*
Lajovic, Dusan S., 3,909,182.
Colglazier, David E.; and Larson, Willis A., to Magic Dot, Inc. Touch actuated electronic switch. 3,909,625, Cl. 307-116.000.
Collins, Benjamin P.; and Novello, John J., to Collins Synthetics, Inc. Molded or extruded synthetic railroad ties, beams and structural members. 3,908,902, Cl. 238-83.000.
Collins, George Thomas, to British Industrial Plastics Limited. Electrical control of machines. 3,909,172, Cl. 425-162.000.
Collins, Michael John; Cruse, Bernard William, Jr.; and Goetchius, Ronald James, to CEM Corporation. Automatic volatility computer. 3,909,598, Cl. 235-151.300.
Collins Synthetics, Inc.: *See—*
Collins, Benjamin P.; and Novello, John J., 3,908,902.
Colombie, Michel, to Creusot-Loire. Non corrosive flux for soft solder. 3,909,312, Cl. 148-24.000.
Colorcon Incorporated: *See—*
Woznicki, Edward J.; and Signorino, Charles A., 3,909,284.
Colville, Larry L.: *See—*
Kniesly, Richard A.; Colville, Larry L.; and Mullen, Jerrold L., 3,909,619.
Comber, Bogdan. Light generating apparatus. 3,909,650. Cl. 313-148.000.
Comeau, George O.: *See—*
Ordway, Richard S.; Quinn, Richard E.; and Comeau, George O., 3,908,592.
Commissariat a l'Energie Atomique: *See—*
Dupuy, Gerard, 3,909,350.
Grescini, Jean; Glenat, Henri; and Salvi, Anteine, 3,909,706.
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Compagnie Europeenne de Teletransmission (C.E.T.T.): *See—*
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Compagnie Francaise d'Etudes et de Construction "Technip": *See—*
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Compagnie Generale d'Electronique Industrielle Lepaute: *See—*
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Compagnie Honeywell Bull: *See—*
Mazier, Claude Marie Gaston Jacques, 3,909,782.
Palombo, Gaston Albert; and Brecy, Andre Achille, 3,909,734.
Touron, Serge Auguste; Duval, Jean-Claude; and Mottini, Francis, 3,909,805.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Augier de Cremiers, Francois, 3,909,528.
Comte, Pierre: *See—*
Courvoisier, Guy; Comte, Pierre; and Chevrolet, Gerard, 3,909,028.
Comtelco (U.K.) Limited: *See—*
Hill, John; and Turczanski, Henry, 3,908,266.
Conard, Albert C.: *See—*
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Condo, Albert C.: *See—*
Borchert, Alfred E.; Condo, Albert C.; Gzemski, Felix C.; McGrogan, John F.; and Wilbur, Benjamin C., 3,909,474.
Condolios, Elie, to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM). Hydraulic dredging system and method for collecting and removing material from deep sea beds. 3,908,290, Cl. 37-58.000.
Congoleum Industries, Inc.: *See—*
Winters, Donald C., 3,909,346.
Conklin, Thomas H.; Crowell, Merton H.; and Singer, Barry M., to North American Philips Corporation. Camera tube having lens element for each element of tri-glycerine sulfate mosaic. 3,909,654, Cl. 313-388.000.
Conn, Jay B.; and Spector, George. Floss pic. 3,908,678, Cl. 132-92.00A.
Consoli, Sebastian A., to Tillotson Corporation. Vinyl plastisol compositions. 3,909,488, Cl. 260-42.490.
Conti, Vincent N., to Dairy Cap Corporation. Cap feeding device. 3,908,341, Cl. 53-314.000.
Continental Can Company, Inc.: *See—*
Chiappe, Wayne T., 3,908,857.
Continental Oil Company: *See—*
McClaflin, Gifford George, 3,909,429.
McGuire, Stephen E.; Riddle, John L.; Nicks, Gene E.; Kerfoot, Oliver Carl; and Kennedy, Carl D., 3,909,432.
Ruckel, Paul J.; and McFeeters, Melvin M., 3,909,389.
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Conzinc Riotinto of Australia Limited: *See—*
Holliday, Robin David; and McIntosh, Peter, 3,909,375.
Cook Paint & Varnish Company: *See—*
Wright, Howard J.; and Van Horn, Charles R., 3,909,479.
Cooper, Lloyd R., to Heppenstall Company. Methods of producing large steel ingots. 3,908,732, Cl. 164-4.000.
Cooper, Lloyd R., to Heppenstall Company. Methods of producing large steel ingots. 3,908,736, Cl. 164-52.000.
Cooper, Roydon B., to Pall Corporation. Coaxial bidirectional flow control and relief valves and hydrostat system containing the same. 3,908,693, Cl. 137-493.000.
Copeland, Mark I.; and Howe, John S., to United States of America, Interior. Prevention of surface cracking due to formation of copper alloys of tin and antimony during reheating of steel. 3,909,251, Cl. 75-125.000.
Cops, Michael Herbert: *See—*
Ironside, John Michael; and Cops, Michael Herbert, 3,908,614.
Cordazzo, Jean-Louis: *See—*
Ferre, Salvador; Lotan, Dan; Morbioli, Rene Jean; Schmitt, Jean-Claude Alphonse Henri; and Cordazzo, Jean-Louis, 3,909,652.
Cordelle, Jean: *See—*
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Cormany, M. Denton: *See—*
Wilks, Alan L.; Richerson, James D.; and Cormany, M. Denton, 3,909,762.
Corrigan, Thomas J., to United Technologies Corporation. Fuel cell system including reform reactor. 3,909,299, Cl. 136-86.00C.
Cortese, Cesare; and Castoldi, Giuseppe, to Saiag S.p.A. Industria Articoli Gomma. Conveyor, particularly for passengers. 3,908,811, Cl. 198-16.0MS.
Cosmeti-Loc Corporation: *See—*
Kessler, Berton J., 3,908,674.
Costello, James: *See—*
Breckner, Gerald; Terlecki, Leo; Goulish, Gabriel; and Costello, James, 3,909,090.
Cotter, Richard B.: *See—*
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Cotton Incorporated: *See—*
Getchell, Nelson F.; Hollies, Norman R. S.; and Stanton, Samuel S., 3,908,408.
Cottrill, Jon R.: *See—*
Foucart, Donald D.; and Cottrill, Jon R., 3,909,289.

Coucher, Robert G., to EPPCO. Powder feeder. 3,909,068, Cl. 302-26.000.

Coughlin, Donald W. Butterfly valve main-tapping apparatus. 3,908,691, Cl. 137-315.000.

Coulter, Gordon L.; and Pearsall, Duane D., to Rixson-Firemark, Inc. Particulate products of combustion detector for closure frame. 3,908,309, Cl. 49-31.000.

Council of Scientific & Industrial Research: *See—*
Udupa, Handady Venkatakrishna; and Narasimham, Kapisthalam Chetlur, 3,909,369.

Courvoisier, Guy; Comte, Pierre; and Chevrolet, Gerard, to F. Salomon & Fils. Knee twist sensing ski binding. 3,909,028, Cl. 280-11.35D.

Coval, Arthur B.: *See—*
Lee, Arthur L.; and Coval, Arthur B., 3,908,841.

Cover, Walter E., to Bertea Corporation. Drive mechanism. 3,908,472, Cl. 74-25.000.

Coville, William E.: *See—*
Bruzas, John A.; and Coville, William E., 3,908,738.

Cowley, Gary. Single pedestal drafting table. 3,908,561, Cl. 108-6.000.

Cox, Donald Clyde; and Reudink, Douglas Otto John, to Bell Telephone Laboratories, Incorporated. Linear amplification using nonlinear devices and feedback. 3,909,742, Cl. 330-84.000.

Cox, Elmer Adrian; Tiner, Wayne Douglas; and Woods, Ritchey Paul, Jr., to H. B. Zachry Co. Installation of conduits in precast concrete housing. 3,908,321, Cl. 52-79.000.

Cox, John F., Sr.; Nelboeck, Edgar F.; and Uline, Robert E. Handle actuated dispensing device. 3,908,872, Cl. 222-469.000.

Cox, Tom W.: *See—*
Cunningham, Donald C.; Keyes, Esse Harold; and Cox, Tom W., 3,908,992.

Crahan, Michael J.; and Bergeron, Daniel A. Collapsible shopping center toy with collapsible movable wall sections. 3,908,304, Cl. 46-12.000.

Crawford, Ernest A.: *See—*
O'Connor, Ward F.; and Crawford, Ernest A., 3,908,471.

Crawford, Wheeler C.; and Godfrey, Arthur W., to Texaco Inc. Lubricating oil composition. 3,909,425, Cl. 252-32.70E.

Crawley, Douglas Gerald: *See—*
Grimmett, Michael Charles; and Crawley, Douglas Gerald, 3,909,655.

Cremers, Johann Heinrich. Method and apparatus for cleaning textile floor covering. 3,909,197, Cl. 8-158.000.

Creusot-Loire: *See—*
Colombie, Michel, 3,909,312.

Creusot-Loire Entreprises: *See—*
Bonnaure, Edouard, 3,908,972.

Creutz, Hans-Gerhard, to Oxy Metal Industries Corporation. Noncyanide zinc plating. 3,909,373, Cl. 204-55.00R.

Cribben, James T.: *See—*
Goss, Lorane C., Jr.; Cribben, James T.; and Miller, Joseph J., 3,908,730.

Critchlow, James A., to Xerox Corporation. Copying method and apparatus with means to effect visible ray imaging and infrared ray transfixing or fusing. 3,909,613, Cl. 250-319.000.

Crocker, Guy J.: *See—*
Bemmels, Cyrus W.; and Crocker, Guy J., 3,908,827.

Crosby, Robert J.: *See—*
Day, James T.; Crosby, Robert J.; and Wills, Walter R., 3,909,380.

Crowell, Merton H.: *See—*
Conklin, Thomas H.; Crowell, Merton H.; and Singer, Barry M., 3,909,654.

Crowle, William G.; and Ostrowsky, Efrem M., to VCA Corporation. Air freshener container or vapor diffusing device. 3,908,906, Cl. 239-58.000.

Cruse, Adrian Robert. Backing members for garment fastening devices. 3,908,237, Cl. 24-95.000.

Cruse, Bernard William, Jr.: *See—*
Collins, Michael John; Cruse, Bernard William, Jr.; and Goetchius, Ronald James, 3,909,598.

CTS Corporation: *See—*
Rozema, Arthur L.; and Alm, Howard G., 3,909,769.

Culmone, Vincent A.; and Kaniecki, Thaddeus J., to American Cyanamid Company. Process for preparing powdered cleaning and detergent composition. 3,909,461, Cl. 252-539.000.

Cumberland Engineering Company, Inc.: *See—*
Shah, Sunil Chunilal, 3,908,497.

Cunningham, Donald C.; Keyes, Esse Harold; and Cox, Tom W. Portable football goal post. 3,908,992, Cl. 273-55.00R.

Curran, Patrick M.: *See—*
Brazer, Geoffrey R.; Curran, Patrick M.; and Terkelsen, Bruce E., 3,908,733.

Curtiss-Wright Corporation: *See—*
Kumar, Vasant R., 3,909,013.
Pelak, Andrew; and Michelsohn, Fred H., 3,908,439.

Curto, Paul A., to United States of America, Army. Sting oscillator. 3,908,786, Cl. 181-.500.

Cushing, Donald S.: *See—*
Schimke, Thomas O.; and Cushing, Donald S., 3,908,681.

Cushing, Richard D.: *See—*
Tracy, Robert W.; and Cushing, Richard D., 3,908,724.

Cushman Industries, Incorporated: *See—*
Selden, Boynton, 3,908,383.

Cushman, Maurice E. Shredder attachment for rotary mowers. 3,908,913, Cl. 241-101.700.

Cushman, Maurice E. Shredder attachment for rotary mowers. 3,908,914, Cl. 241-101.700.

Cushman, Robert Holbrook, to Gould Inc. Positive displacement casting. 3,908,739, Cl. 164-80.000.

Cushman, Robert Holbrook: *See—*
Schenk, Raymond L., Jr.; Cushman, Robert Holbrook; and Keizer, Alan S., 3,908,742.

Cushman, Walton W., to Romanski, Lon H. Roadway construction and method therefor. 3,909,143, Cl. 404-27.000.

Custom Electronics Incorporated: *See—*
Plummer, Jan P., 3,909,531.

Cutter Laboratories Inc.: *See—*
Von Alven, Raymond D., 3,908,952.

Cvetko, Henry J.; and Williams, Michael, to Astatic Corporation, The. Tone arm and phonograph pickup assemblies. 3,909,009, Cl. 274-37.000.

Dahl, Bjorn, to A/S Kongsberg Vapenfabrikk. Proximity fuse. 3,908,551, Cl. 102-70.20G.

Dai-Doh Plant Engineering Corporation: *See—*
Aoyama, Yoshio, 3,909,405.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Shikaya, Yukihiro, 3,908,523.

Daimler-Benz Aktiengesellschaft: *See—*
Barenyi, Bela, 3,908,478.
Barenyi, Bela; Wilfert, Karl; and Renner, Hermann, 3,909,039.
Bonisch, Herbert; and Geier, Bernd, 3,909,063.
Lamm, Heinz, 3,908,612.

Dairy Cap Corporation: *See—*
Conti, Vincent N., 3,908,341.

Dalke, James A.; and Hough, Wayne E., to MetroData Corporation. Multiple channel alphanumeric residential television video signal generator. 3,909,818, Cl. 340-324.0AD.

Daly, Edward J., to Raytheon Company. Antenna system. 3,909,829, Cl. 343-100.0SA.

Dana Corporation: *See—*
Bowman, Miles Augustus, Jr.; Hampton, Christopher James; and Schock, Paul Henry, 3,908,435.

Danfoss A/S: *See—*
Beierholm, Hans Mogens, 3,909,747.

Daniel, William H.; and Robey, Melvin J., to Purdue Research Foundation. Planted surface conditioning system. 3,908,385, Cl. 61-11.000.

Darnell, Eula K. Mathematics visual teaching aid. 3,908,287, Cl. 35-31.00D.

Datametrics Corporation: *See—*
Walker, John A.; and Dimitri, Dimitri S., 3,909,588.

Daunheimer, Lyn R.; and Irvine, William M., to Masonite Corporation. Apparatus for making decorative panels. 3,908,588, Cl. 118-58.000.

Dautzenberg, Norbert: *See—*
Findeisen, Gerhard; Dautzenberg, Norbert; and Gesell, Hartmut, 3,909,239.

Davidson, Charles S., to Byrne Doors, Inc. Canopy door. 3,908,310, Cl. 49-205.000.

Davidson, James R., to Xerox Corporation. Manifold imaging process with spool electrode. 3,909,257, Cl. 96-1.00M.

Davidson, William G., to AMF Incorporated. Golf car suntop. 3,908,777, Cl. 180-69.00C.

Davis, Robert L.: *See—*
Lang, Thomas J.; Lang, Joseph A.; Lang, Kenneth G.; and Davis, Robert L., 3,908,782.

Davy Powergas GmbH: *See—*
Kerner, Walter; Mahler, Friedrich; and Peters, Heinrich, 3,908,904.

Dawawala, Suryakant K., to Westinghouse Electric Corporation. Three stage, double tapered dashpot. 3,908,701, Cl. 137-630.150.

Day, Donald F. Dual cylinder feeder for course granular material. 3,908,865, Cl. 222-135.000.

Day, James T.; Crosby, Robert J.; and Wills, Walter R., to Komline-Sanderson Engineering Corporation. Reference pattern zeta potential measurement apparatus and method therefor. 3,909,380, Cl. 204-180.00R.

Day, Paul B., to Gai-Tronics Corporation. Mine paging and telephone system. 3,909,547, Cl. 179-40.000.

Daystrol-Scientific, Inc.: *See—*
Fudge, Robert G., 3,908,651.

Dayton Progress Corporation: *See—*
Gargrave, Robert J.; and Holiga, Ludomil A., 3,908,500.

Dayton-Walther Corporation: *See—*
Afanador, Carlos P.; and Tschabrun, Richard G., 3,908,480.

Dean, James Clement: *See—*
Durno, Ronald Arthur; and Dean, James Clement, 3,908,399.

Dean, Joseph M.; and Olson, Kenneth G. Apparatus for demonstrating grounding principles. 3,908,286, Cl. 35-19.00A.

Debaye, Jean, to Societe Anonyme des Etablissements Jouvenel & Cordier. Solenoid valve. 3,908,700, Cl. 137-625.650.

Decker, Hans-Heino, to Rollei-Werke Franke & Heidecke. Electronic flash apparatus. 3,909,667, Cl. 315-241.00P.

Deerfield, Alan J.: *See—*
Wallach, Steven J.; Deerfield, Alan J.; and Nissen, Stanley M., 3,909,798.

Deering Milliken Research Corporation: *See—*
Machell, Greville; and Thomas, Manuel A., 3,909,195.

Deffeyes, Robert J.; and Tyler, Wesley R., to Graham Magnetics Incorporated. Method of producing acicular metal crystals. 3,909,240, Cl. 75-.5AA.

Defossez, Roger: *See—*
Lou, Wo Joaa; Volgyi, Paul; and Defossez, Roger, 3,908,243.

Degen, Frederick I.; and Waldron, Gregory R. Dividing head. 3,908,484, Cl. 74-813.00R.

de Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Modulation device applicable especially to the braking circuit of an automobile vehicle. 3,909,073, Cl. 303-21.00F.

Degner, Dieter, to BASF Aktiengesellschaft. Electrolytic manufacture of alkyl-substituted hydroquinones. 3,909,376, Cl. 204-73.000.

de Hedouville, Philippe, to U.S. Philips Corporation. Deflector for the door of a washing-machine tub. 3,908,412, Cl. 68-24.000.

deKlerk, Frans: *See—*
Schuyf, Willem; Tent, Bart; Pattynama, Philip W.; and deKlerk, Frans, 3,908,769.

Delgendre, Jacques C.; Hamon, Emile F.; and Berton, Georges A., to Etat Francais. Electrical relay containing a pyrotechnical charge and having no moving parts. 3,909,567, Cl. 200-61.080.

Dellar, Richard John: *See—*
McGuigan, Brian; Dellar, Richard John; and Phillips, William David, 3,909,448.

Demag Aktiengesellschaft: *See—*
Spiecker, Karl-Heinz; Mudersbach, Wolfgang; and Michel, Rolf, 3,908,424.
Stark, Heinz, 3,909,499.

de Mesquita Cardoso, Edgar Antonio. Panoramic photographic methods. 3,909,121, Cl. 352-44.000.

Demetrick, Roy W., to Boeing Company, The. Translating multi-ring inlet for gas turbine engines. 3,908,683, Cl. 137-/15.100.

Demler, Henry William, Sr., to AMP Incorporated. Method of joining plastic pipe. 3,908,261, Cl. 29-450.000.

DeMola, Louis D. Tire removing tool. 3,908,728, Cl. 157-1.220.

Dench, John E.; Knutson, Harry; and Seven, Manfred K., to Allied Chemical Corporation. Ethylene-acrylic acid-vinyl acetate terpolymer telomer waxes. 3,909,280, Cl. 106-271.000.

Denis, Louis H., to Compagnie Francaise d'Etudes et de Construction "Technip". Gas sealing assembly. 3,909,012, Cl. 277-15.000.

Denley, Ronald S., to Teletype Corporation. Printer paper roll holder with spring-controlled line feed tensioner. 3,908,810, Cl. 197-133.00R.

Dennehey, F. Michael; and Weiss, Reinhold M., to Memorex Corporation. Cassette receptacle and storage apparatus. 3,909,088, Cl. 312-12.000.

Dennison Manufacturing Company: *See—*
Dudley, John S.; and Hollis, Ralph E., 3,908,295.

Dent, Barry H., to Badger Meter, Inc. Circuit use warning device. 3,909,561, Cl. 179-175.20C.

DePedro, Donald: *See—*
Harris, George Jerry; and DePedro, Donald, 3,909,792.

Depenbrock, Manfred, to BBC Brown Boveri & Company Limited. Arrangement for supplying direct current to a consumer from an alternating current source with interposed transformer and rectifier establishing periodic rapid changes in transformation ratio. 3,909,697, Cl. 321-8.00R.

Derda, Harry J.; and Gibbs, Charles H. Dental articulator. 3,908,271, Cl. 32-32.000.

Dessauer, Rolf; and Looney, Catharine Elizabeth, to Du Pont de Nemours, E. I., and Company. Decoration of substrates by thermal transfer of photosensitive, thermoplastic, dye-imaged film. 3,909,328, Cl. 156-219.000.

Detexomat Machinery Limited: *See—*
Haselgrove, Bob; and Nichol, John Derek, 3,908,874.

Detwiler, Melvin F. Cleaning tool for gutters and cavetroughs. 3,908,910, Cl. 239-280.000.

Deutsch, Ralph, to Nippon Gakki Seizo Kabushiki Kaisha. Harmonic modulation and loudness scaling in a computer organ. 3,908,504, Cl. 84-1.190.

De Volder, Noel Jozef: *See—*
Gilliams, Yvan Karel; Van Engeland, Jozef Leonard; and De Volder, Noel Jozef, 3,909,433.

DeVries, Donald L.; Chao, Tai S.; and Vitchus, Bernard C., to Atlantic Richfield Company. Composition and method. 3,909,428, Cl. 252-42.700.

DeVries, Frederick William, to Du Pont de Nemours, E. I., and Company. Process for soil stabilization. 3,908,388, Cl. 61-36.00R.

Diamond International Corporation: *See—*
Peppler, William S.; and Beinssen, Hans W., 3,909,290.

Diaz, Arthur F.; and Guth, Eugene D., to KVB Engineering, Inc. Coal desulfurization process. 3,909,211, Cl. 44-1.00R.

Di Candia, Armando, to Italsider S.p.A. Method and device for the continuous casting of killed steel with artificial wildness. 3,908,735, Cl. 164-66.000.

Dick, John O., to United States of America, Navy. Fuze signal processing circuit. 3,908,552, Cl. 102-70.20P.

Dickinson, George Alfred, to Pilkington Brothers Limited. Method and apparatus for modifying flow in the refining zone of a glass melting tank. 3,909,227, Cl. 65-134.000.

Dickson, George; and Westergaard, Robert K., to King-Seeley Thermos Co. Ice making machine. 3,908,390, Cl. 62-73.000.

Diebold, Incorporated: *See—*
Morello, Herbert; and Mountford, George S., 3,909,595.

Diekers, Hermann-Josef, to Wandel u. Goltermann. Digital frequency meter. 3,909,716, Cl. 324-78.00D.

Dillard, Fred H.: *See—*
Cagle, William S.; and Dillard, Fred H., 3,908,759.

Dim-Rosy: *See—*
Giberstein, Bernard, 3,908,822.

Dimitri, Dimitri S.: *See—*
Walker, John A.; and Dimitri, Dimitri S., 3,909,588.

Dinsmore, Daniel, Jr.: *See—*
Phelps, Howard Neile, Jr.; and Dinsmore, Daniel, Jr., 3,908,790.

Director of Agency of Industrial Science & Technology: *See—*
Kishi, Yasuo; Yokoo, Toshiaki; Imai, Terutoyo; Kanatani, Keiichi; and Yazaki, Takehito, 3,909,270.

Diver, Leo Bernard: *See—*
Wilkinson, Wilfred Henry; and Diver, Leo Bernard, 3,909,085.

Dixon, William Bradley: *See—*
Vaughn, John Edward; and Dixon, William Bradley, 3,908,793.

Dobrovolny, Pierre; and Knight, Stanley P., to Zenith Radio Corporation. UHF Hybrid tuner. 3,909,726, Cl. 325-357.000.

Dobrunz, Ronald C.: *See—*
Wenger, Jerry A.; Paine, David L.; Urch, Harvey M.; Dobrunz, Ronald C.; and Probst, Ronald N., 3,908,787.

Dr. -Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Binder, Robert, 3,908,798.

Dr. Johannes Heidenhain GmbH, Firma: *See—*
Kraus, Heinz, 3,909,760.

Doi, Munebaru: *See—*
Akiyama, Shunichi; Doi, Munebaru; Arai, Yoshiaki; Nakao, Yoshio; and Fukuda, Hideo, 3,909,352.

Dolby Laboratories, Inc.: *See—*
Dolby, Ray Milton, 3,909,733.
Dolby, Ray Milton, 3,909,737.

Dolby, Ray Milton, to Dolby Laboratories, Inc. Dynamic range modifying circuits utilizing variable negative resistance. 3,909,733, Cl. 328-165.000.

Dolby, Ray Milton, to Dolby Laboratories, Inc. Floating electrical output circuit. 3,909,737, Cl. 330-25.000.

DoLoreto, Edward. Self-locking threaded insert and method of making same. 3,908,214, Cl. 10-86.00R.

Domkraft AB Nike: *See—*
Bjork, Bengt Anders, 3,908,944.

Donnet, Henry, to Ste. d'Application Plastique Mecanique et Electronique Plastimecanique. Web registration method and apparatus. 3,908,331, Cl. 53-3.000.

Donofrio, William T.: *See—*
Man, Pang L.; Chen, Calvin H.; and Donofrio, William T., 3,908,669.

Dorler, Jack A., to International Business Machines Corporation. Cross-coupled capacitor for AC performance tuning. 3,909,637, Cl. 307-320.000.

Dornier GmbH: *See—*
Fritzsche, Albert; and Jager, Karl, 3,909,164.

Dornier Sustem GmbH.: *See—*
Huf, Franz, 3,909,163.

Doroshow, Louis W. Rigid urethral instrument. 3,908,637, Cl. 128-2.00F.

Double Check Industries, Inc.: *See—*
Gottwald, Antonin, 3,908,871.

Douglas, Robert P.: *See—*
Wunluck, Bruce R.; Draayer, Johannes; Young, John S.; Van Bosse, John G.; and Douglas, Robert P., 3,909,542.

Dover Corporation: *See—*
Bromley, Thomas D.; and Stark, Marvin L., 3,908,941.

Dow Badische Company: *See—*
Beagle, Robert B., 3,908,350.

Dow Chemical Company, The: *See—*
Alexander, George B.; and Carpenter, Norman F., 3,909,437.
Madison, Norman L.; Meyer, Victor E.; Beaumont, Gerald P.; and Nelson, Alfred R., 3,909,477.
Niles, Earl Thomas, 3,909,324.
Ryan, Richard A.; and Galeone, Vincent A., 3,908,285.

Dow Corning Corporation: *See—*
Brown, Paul L., 3,909,434.
Clark, Harold A., 3,909,424.

Draayer, Johannes: *See—*
Wunluck, Bruce R.; Draayer, Johannes; Young, John S.; Van Bosse, John G.; and Douglas, Robert P., 3,909,542.

Dragerwerk AG: *See—*
Eckstein, Wolfgang, 3,908,649.

Drapeau, Raoul E., to Scope Incorporated. Item selecting system. 3,908,800, Cl. 186-1.00R.

Drath, Edwin H. Filter unit and retaining plug closure. 3,909,414, Cl. 210-232.000.

Dravo Corporation: *See—*
Vlnaty, Joseph, 3,908,970.

Dreiseitl, Walter: *See—*
Blaschke, Felix; and Dreiseitl, Walter, 3,909,688.

Drilling, Joseph C.; and Jones, Lary D., to Square D Company. Utility handle. 3,908,225, Cl. 16-124.000.

Drilling, Joseph C.: *See—*
Reed, Ronald H.; Drilling, Joseph C.; and Jones, Lary D., 3,909,098.

Drong, Michael C.; and Moeny, William M., to United States of America, Navy. High energy laser power meter. 3,908,457, Cl. 73-190.00R.

Du Pont of Canada, Limited: *See—*
Gemmill, Robert George, 3,909,175.

Dube, Alfred, to Heritage Silversmiths Limited. Lead containing ceramic compositions which further contain a lead release inhibiting amount of a chromium compound. 3,909,277, Cl. 106-49.000.

Dubin, Pauline. Woman's brassiere. 3,908,670, Cl. 128-482.000.

Dudley, Albert Edward Frederick, to Saunders & Dudley Limited. Motorized wheel. 3,908,776, Cl. 180-65.00F.

Dudley, John S.; and Hollis, Ralph E., to Dennison Manufacturing Company. Switch-proof ticket system and method. 3,908,295, Cl. 40-25.000.

Duennenberger, Max; and Schellenbaum, Max, to Ciba-Geigy AG. Disinfectant composition including a substituted 2-hydroxy benzophenone. 3,909,436, Cl. 252-107.000.

Duffield, Cedric A., to Greencastle Metal Works. Fort adapter for front end loader. 3,908,844, Cl. 214-145.000.

Dunbar, Glenn G. Hydraulic rotator mechanism. 3,908,695, Cl. 137-580.000.

Dunford Hadfields Limited: *See*—
Hobson, John Douglas; and Lomas, Teddie Ward, 3,909,133.

Dunkl, Franz S.; Ross, Sidney D.; and Finkelstein, Manuel, to Sprague Electric Company. Capacitor and electrolyte. 3,909,682, Cl. 317-230.000.

Dunn, Lyman D.: *See*—
Ricobene, Sam; and Dunn, Lyman D., 3,908,852.

Dunn, Robert M.; and Gray, Bruce H., to United States of America, Army. Hybrid analog and digital computer. 3,909,597, Cl. 235-150.500.

Dunshee, Wayne Keith; and Vier, Clark Edward, to Minnesota Mining and Manufacturing Company. Abrasion and soil resistant microporous medical adhesive tape. 3,908,650, Cl. 128-156.000.

Du Pont de Nemours, E. I., and Company: *See*—
Blum, Josef, 3,908,878.
Dessauer, Rolf; and Looney, Catharine Elizabeth, 3,909,328.
DeVries, Frederick William, 3,908,388.
Eastman, Ernest Francis, 3,909,333.
Gray, Russell Houston, 3,909,282.
Hyson, Archibald Miller, 3,909,236.
Polss, Perry, 3,909,214.
Selby, Donald W., 3,908,818.
Waggoner, Marion Glen, 3,909,487.
Walmsley, Peter Newton, 3,909,378.

Dupuy, Gerard, to Commissariat a l'Energie Atomique. Device for handling fuel assemblies within a nuclear reactor core. 3,909,350, Cl. 176-30.000.

Durham, Jerry L. Hand tool for mounting truck tires. 3,908,490, Cl. 81-420.000.

Durling, Harold, to Midland-Ross Corporation. Air control valve for a pneumatic brake system. 3,909,069, Cl. 303-9.000.

Durno, Ronald Arthur; and Dean, James Clement, to United Technologies Corporation. Primary flight control with isolated gear box. 3,908,399, Cl. 64-17.00R.

Durran, Donald A., to United States of America, Air Force. Multiple fluid flow proportioning system. 3,908,936, Cl. 244-117.00A.

Duval, Jean-Claude: *See*—
Touron, Serge Auguste; Duval, Jean-Claude; and Mottini, Francis, 3,909,805.

Duwe, Robert Christian. Sheet handling equipment. 3,909,056, Cl. 294-67.0BB.

Dworkin, Darryl R.: *See*—
Wuertemburg, Charles W.; and Dworkin, Darryl R., 3,909,007.

Dworschack, Robert G.: *See*—
Littlejohn, James H.; and Dworschack, Robert G., 3,909,355.

Dye, Richard A., to Hughes Aircraft Company. Laser transmitter system. 3,909,745, Cl. 331-94.5PE.

Dykzeul, Theodore J., to Robertshaw Controls Company. Thermostat mounting assembly. 3,908,898, Cl. 236-21.00B.

E-B Industries, Inc.: *See*—
Kelly, Cornelius James Noel; Morrow, William Clinton; and Zappalorti, Alvaro, 3,908,509.

Earl, Arnold M. Flame control in furnace burners. 3,909,184, Cl. 431-75.000.

Eastman, Ernest Francis, to Du Pont de Nemours, E. I., and Company. Melt-stabilized segmented copolyester adhesive. 3,909,333, Cl. 156-331.000.

Eastman Kodak Company: *See*—
Goodhue, Charles T.; and Risley, Hugh A., 3,909,359.
Gresens, Robert I., 3,908,930.
Herz, Arthur H., 3,909,272.
Schmidt, Peter; and Haberle, Karl-Heinz, 3,909,124.

Ebbinghaus, William W.; and Myers, John H., to Federal Paper Board Company, Inc. Packaging machine. 3,908,332, Cl. 53-48.000.

Eberle, Jurg, to Fehr & Reist AG. Conveying apparatus with controlled spray means for coating printed products. 3,908,583, Cl. 118-2.000.

Eckart, Edmund Albert, Jr., to Sapolin Paints, Inc. Color display device and selection aid. 3,908,563, Cl. 108-77.000.

Eckstein, Wolfgang, to Dragerwerk AG. Personal filter respirator. 3,908,649, Cl. 128-147.000.

Economou, Peter; Hardy, John F.; and Renner, Alfred, to Cabot Corporation; and Ciba-Geigy AG. Urea-formaldehyde pigmentary fillers used in paper. 3,909,348, Cl. 162-166.000.

Eguchi, Isamu: *See*—
Ishikawa, Hiroaki; Sei, Makio; and Eguchi, Isamu, 3,909,082.

Eguchi, Yoshihiro, to Hochiki Corporation. Detecting and control method and apparatus. 3,909,814, Cl. 340-237.00S.

Ehrsam, Robert F., to Raymond, John L.; and Reath, Robert Z. Purification of chromium plating solutions by electrodialysis. 3,909,381, Cl. 204-180.00P.

Eide, Svein, to Polaris Fabrikker A.S. Stove top assembly. 3,909,592, Cl. 219-462.000.

Eisai Co., Ltd.: *See*—
Nakashima, Todomu; and Takahashi, Naoki, 3,909,228.

Eisemann, Kurt, to U.S. Philips Corporation. Device for rotary latching and unlatching. 3,908,481, Cl. 74-527.000.

Eisenwerk-Gesellschaft Maximilianshutte mbH: *See*—
Brotzmann, Karl; and Fassbinder, Hans Georg, 3,909,245.

Eisenwerk Weserhutte A.G.: *See*—
Vahle, Klaus-Heinrich, 3,909,083.

Elba Werk, Maschinen-Gesellschaft mbH & Co.: *See*—
Hanss, Paul, 3,908,838.

Elder, Frederick A., to International Rectifier Corporation. Low impedance transmission line for bypassing radio frequency energy around high voltage rectifier stacks. 3,909,699, Cl. 321-11.000.

Electro Optik GmbH & Co.: *See*—
Menke, Josef F., 3,909,104.

Eli Lilly and Company: *See*—
Beck, James R., 3,909,235.

Elitex, Zavody textilniho strojirenstvi generalni veditelstvi: *See*—
Maler, Josef; Lorenc, Jaroslav; and Kouklik, Ivo, 3,908,406.

Elkem Spigerverket A/S: *See*—
Skreien, Nils, 3,909,242.

Ellington, Henry G.: *See*—
Jardine, Robert D.; and Ellington, Henry G., 3,908,448.

Ellis, Robert S.: *See*—
Williams, Arthur L.; and Ellis, Robert S., 3,909,578.
Williams, Arthur L.; and Ellis, Robert S., 3,909,579.

Eltee Pulsitron(Entire): *See*—
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Emco Wheaton Inc.: *See*—
Bower, Allen M., 3,908,718.

Emery Industries, Inc.: *See*—
Najour, Gerald Costa; and Witt, Peter Ray, 3,909,482.

Enei, Hitoshi: *See*—
Tsuchida, Takayasu; Matsui, Hiroshi; Enei, Hitoshi; and Yoshinaga, Fumihiro, 3,909,353.

Energetics Science, Inc.: *See*—
Oswin, Harry G.; and Bay, Howard W., 3,909,386.

Energy Development Associates: *See*—
Carr, Peter, 3,909,298.

Engel, Steven F. Ski binding. 3,908,971, Cl. 280-11.35K.

Engler Instrument Company: *See*—
Graziano, Ronald M., 3,908,353.

Engler Instrument Company, division of Sangamo Electric Company: *See*—
Tomasello, Frank, 3,908,354.

English, Paul Everitt; Ashcroft, Ian Reginald; Norris, Paul Alfred; Salter, Frank Michael; Laws, William Robert; and McChesney, Herbert Raymond, to British Iron and Steel Research Association, The. Temperature sensing device. 3,908,459, Cl. 73-341.000.

Engstrom, Hans B., to AB Mecman. Sealing device. 3,909,017, Cl. 277-168.000.

Enviro-Gro, Inc.: *See*—
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EPPCO: *See*—
Coucher, Robert G., 3,909,068.

Erco Envirotech Ltd.: *See*—
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Erdmann, Hans; and Miller, Franz Friedrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Tanning formulations. 3,909,193, Cl. 8-94.330.

Erdolchemie Gesellschaft mit beschrankter Haftung: *See*—
Becker, Wolf-Jurgen; Schulte, Franz-Josef; and Siemer, Klaus, 3,909,202.

Erhardt, Stefan, to Anderson Bros. Mfg. Co. Apparatus for feeding and applying individual lids to containers. 3,908,340, Cl. 53-307.000.

Ericson, Gloria J.: *See*—
Schmaedeke, Ruth H.; Schmaedeke, Wayne W.; Ericson, Gloria J.; and Ericson, Lennart A., 3,909,031.

Ericson, Lennart A.: *See*—
Schmaedeke, Ruth H.; Schmaedeke, Wayne W.; Ericson, Gloria J.; and Ericson, Lennart A., 3,909,031.

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Ernst, Franz J. M., to Mobil Oil Corporation. Method for reducing foam in water containing systems. 3,909,445, Cl. 252-321.000.

Ernst Reinhardt GmbH: *See*—
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Erfeld, Heinrich: *See*—
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Sanders, Robert N., 3,909,213.

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Eubank, Marcus P. Air conditioning unit containing condenser with evaporative sub-cooler. 3,908,393, Cl. 62-305.000.

Evans, Frederick Drew, Jr.: *See*—
Petersen, Harry Arthur; Kinnan, Mike; and Evans, Frederick Drew, Jr., 3,908,306.

Evans, John; and Hefter, Murray, to Singer Company, The. Low cost, low pressure gas bearing gyro. 3,908,470, Cl. 74-5.60D.
Evansen, Arthur W., to Magnavox Company, The. Facsimile system with memory. 3,909,515, Cl. 178-6.000.
Evett, Herschel Lee, to Griffolyn Company, Inc. Warning underground sheathed tape. 3,908,582, Cl. 116-114.00R.
F B R S.r.l.: *See*—
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F.E.I., Inc.: *See*—
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F. Salomon & Fils: *See*—
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Fa. Ingenieur Gunter Klemm Spezialunternehmen fur Bohrtechnik: *See*—
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Faber, Kurt Heinrich Albert Erich, to Sandvik Aktiebolag. Pin-type clamping device for cutting inserts in tool holders. 3,908,255, Cl. 29-96.000.
Fabril Automaq S.A.I.C.A.F.I.: *See*—
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Fabrique de Machinen Andre Bechler SA: *See*—
Schaer, Hans, 3,909,150.
Fagan, James R., to Rockwell International Corporation. Display system optics. 3,909,525, Cl. 178-7.850.
Fagerstrom, Kurt Gunnar; Goransson, Bertil Henry; and Hellstrom, Per-Olov, to Aktiebolaget Electrolux. Apparatus for continuously cooking food in sequential oven section of an elongated oven. 3,908,533, Cl. 99-386.000.
Fahmie, Michael E. Unitized washing machine bushing. 3,908,411, Cl. 68-23.700.
Fahrig, Robert James: *See*—
Horecky, Carl Joseph, Jr.; Fahrig, Robert James; Shields, Robert James, Jr.; and McKinney, Claude Owen, 3,909,392.
Faller, Rudolph A., to Hoerner Waldorf Corporation. Visual display package. 3,908,826, Cl. 206-463.000.
Fantera, Italo A., to United States of America, Air Force. Performance monitoring/fault location test set for tropo-radio equipment. 3,909,720, Cl. 325-41.000.
Farrelly, Walter M., to Vac-Pac Manufacturing Co. Imbricated bag loading machine. 3,908,343, Cl. 53-385.000.
Fassbinder, Hans Georg: *See*—
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Fastner, Thorwald, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Method of continuously casting wide slabs, in particular slabs wider than 1000 mm. 3,908,744, Cl. 164-82.000.
Fauser, Hans: *See*—
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Faust, Charles L.; and Gurklis, John A., to United States of America, Navy. Self-controlled spring-actuated tool advance for electrochemical machining. 3,909,388, Cl. 204-224.00M.
Faust, Wilfried; and Westphal, Kurt, to Bayer Aktiengesellschaft. Synergistic herbicidal composition for the control of weeds. 3,909,234, Cl. 71-93.000.
Fawn Engineering Corporation: *See*—
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Feldhausen, Marion L. Bingo card with array modification means. 3,909,001, Cl. 273-136.00F.
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Feldmann, Hugo: *See*—
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Rowe, Barry; and Rymer, Harold Frank, 3,909,605.
Ferraro, Luigi. Diver's mask. 3,908,196, Cl. 2-14.00W.
Ferre, Salvador; Lotan, Dan; Morbioli, Rene Jean; Schmitt, Jean-Claude Alphonse Henri; and Cordazzo, Jean-Louis, to Ste. Nationale d'Etude et de Construction de Moteurs d'Aviation. Luminous discharge cell for spectrographic analysis. 3,909,652, Cl. 313-146.000.
Ferro, Armand P., to General Electric Company. Monolithic semiconductor rectifier circuit structure. 3,909,700, Cl. 321-47.000.
Ferro, Walter: *See*—
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Fieldcrest Mills, Inc.: *See*—
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Figiel, Francis J., to Allied Chemical Corporation. Coolant-lubricant composition comprising fluorocarbon-cyclohexanone mixtures. 3,909,431, Cl. 252-54.000.
Fillmore, William E., to Owens-Illinois, Inc. Fluid dispensing apparatus. 3,908,209, Cl. 4-227.000.
Filter Queen Corporation Limited, The: *See*—
Adamson, Gerald James; and O'Grady, James K., 3,908,220.
Findeisen, Gerhard; Dautzenberg, Norbert; and Gesell, Hartmut, to Mannesmann Aktiengesellschaft. Method of controlling bulk density of ferrous powder. 3,909,239, Cl. 75-.5BA.
Finkelstein, Manuel: *See*—
Dunkl, Franz S.; Ross, Sidney D.; and Finkelstein, Manuel, 3,909,682.
Fiorino, Benjamin C.; and Marino, Peter T., to International Business Machines Corporation. High-rate integration, squelch and phase measurements. 3,909,630, Cl. 307-229.000.
Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Herbicide mixtures of 3-lower alkyl-2,1,3-benzothiadiszinone-(4)-2,2-dioxide and N-(1,1-dimethyl)propynyl)-3,5-dichlorobenzamide. 3,909,232, Cl. 71-91.000.
Fischer, Julius F.; and Scully, Daniel F., to Mallinckrodt, Inc. Plastics additives in the form of substantially homogeneous granules and process for making the same. 3,909,472, Cl. 260-23.0XA.
Fisher, John L., to Kuhlman Corporation. Bushing well assembly. 3,909,509, Cl. 174-152.00R.
Fishman, Mark J. Endodontic apical sealer method and apparatus. 3,908,270, Cl. 32-15.000.
Fitton, Robert C., to J. M. Huber Corporation. Modified, precipitated alumino silicate pigments. 3,909,286, Cl. 106-306.000.
Fitzgerald, William Maurice Bard. Opposed free piston engine having start, stop, and restart control means. 3,908,379, Cl. 60-595.000.
Flamand, Jean: *See*—
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Flanagan, Joseph E.; and Haury, Vernon E., to Rockwell International Corporation. Cool burning gun propellants containing triaminoguanidine nitrate and cyclotetramethylene tetranitramine with ethyl cellulose binder. 3,909,323, Cl. 149-19.700.
Flinchbaugh, Dean A., to Bethlehem Steel Corporation. Hot billet sampler. 3,908,464, Cl. 73-424.000.
Flocchini, Andrew J. Automated gathering pen for livestock. 3,908,599, Cl. 119-20.000.
Flow Pharmaceuticals, Inc.: *See*—
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Flowers, Carl C.: *See*—
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Folkert, Henry, to Folkert, Inc. Belt drive and tensioning apparatus. 3,908,476, Cl. 74-242.11A.
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Follrath, Richard D.; Martin, Charles W.; Race, Russell L.; and McPherson, Gerald, to Clark Automation, Inc. Continuous casting machine. 3,908,746, Cl. 164-152.000.
Fong, Wai Min. Board game apparatus. 3,908,998, Cl. 273-131.0AB.
Fontanes, Sylvain, to Compagnie Europeenne de Teletransmission (C.E.T.T.). Non-linear analogue-digital converter for compression coding. 3,909,824, Cl. 340-347.0NT.
Foote, Daniel J., to Master Lock Company. Padlock with deflectable shackle section. 3,908,415, Cl. 70-49.000.
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Forlenza, David N.: *See*—
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Foster, Shelton A.: *See*—
Shapiro, Allen L.; Sherwood, Douglas T.; and Foster, Shelton A., 3,909,790.
Foucart, Donald D.; and Cottrill, Jon R., to Anchor Hocking Corporation. Chuck cleaning methods. 3,909,289, Cl. 134-2.000.
Fowler, Alexander. Work loading, unloading, and positioning means for handling sheet material in power presses and the like. 3,908,980, Cl. 271-3.000.
Fowler, Charles P.; and Balluff, Robert N., to Tenneco Inc. Heat shield for exhaust conduits. 3,908,372, Cl. 60-320.000.
Fox, Hans G. Rotary piston engine having a turbo-supercharger. 3,908,608, Cl. 123-8.050.
Fox, Michael C. Real estate appraisal instrument and method. 3,908,281, Cl. 33-228.000.
Frach, Werner; and Janke, Bernhard. Securing means for fastening structural attachments to hollow metal or plastic shaped parts. 3,908,330, Cl. 52-758.00F.
Francis, Gerald T. Brick panel construction. 3,908,326, Cl. 52-384.000.

Franke, Milton W.: *See—*
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Frazelle, Ronald B.; and Fuller, Neal B., to PBR Company. Modular shelving system for food service storage. 3,908,566, Cl. 108-153.000.
Frechtman, Jean, to Jeanmarie Gallery, Inc. Convertible frame support. 3,908,955, Cl. 248-470.000.
Freitag, Dieter; Rudolph, Hans; Niehaus, Clemens; and Kuchenmeister, Rolf, to Bayer Aktiengesellschaft. Resol resins prepared from dihydroxydiisopropylbenzene. 3,909,495, Cl. 260-51.00R.
Fretwell, Richard D.; Azbell, James W.; and Mason, Edwin E., to MI². Square wave oscillator for a data terminal. 3,909,526, Cl. 178-66.00R.
Frey, Kurt P. H., to Balekjian, Sigrid F., a part interest. Breakwaters for long, short and/or complex water waves. 3,908,384, Cl. 61-4.000.
Friberg, Vincent P.; and Chesney, John, to General Instrument Corporation. Method for calibrating a resonant frequency. 3,908,264, Cl. 29-593.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Jungel, Heinrich, 3,909,692.
Friedrichsen, Wilhelm; and Goehre, Otto, to BASF Aktiengesellschaft. Supported catalyst for the oxidation of o-xylene or naphthalene into phthalic anhydride. 3,909,457, Cl. 252-476.000.
Friese, Karl-Hermann; and Geier, Heinz, to Robert Bosch G.m.b.H. Composition resistor suitable for spark plugs and method of making the same. 3,909,459, Cl. 252-509.000.
Frieseke & Hoepfner GmbH: *See—*
Bosch, Julius, 3,909,615.
Fripiat, Jose, Marie, Maurice, Julien, to Lafarge (Societe Anonyme). Method of grafting organic groups on calcium silicates. 3,909,285, Cl. 106-306.000.
Fritzsche, Albert; and Jager, Karl, to Dornier GmbH. Casing for rotary piston engines of trochoidal construction. 3,909,164, Cl. 418-61.00B.
Fromknecht, Charles Thomas, to Singer Company, The. Vacuum cleaner filter assembly. 3,909,219, Cl. 55-216.000.
Fromm, Erich, to Sulzer Brothers Limited. Rail traction vehicle suspension system. 3,908,559, Cl. 105-453.000.
Frost, Walter Wade: *See—*
Agan, Ernest W., Jr.; Childers, Grady P.; Frost, Walter Wade; and Hunter, John P., Jr., 3,908,250.
Fry, Peter William, to Integrated Photomatrix Limited. Output circuitry for digital instruments. 3,909,729, Cl. 328-50.000.
Fuchs, Peter: *See—*
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Fuchs, Siegfried H., to GTE Automatic Electric Laboratories Incorporated. Emergency transfer circuit for use in a communication switching system. 3,909,545, Cl. 179-27.00G.
Fudge, Robert G., to Daystrol-Scientific, Inc. Medicament injection device. 3,908,651, Cl. 128-173.00H.
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Fuji Electric Co., Ltd.: *See—*
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Fujii, Akira, to Kabushiki Kaisha Fuji Kuromu Sha. Process for treating spent iron-containing chromium plating solution to remove iron values contained therein and regenerate the solution. 3,909,372, Cl. 204-51.000.
Fujii, Ikunori, to Tokyo Juki Kogyo Kabushiki Kaisha. Sewing machine drive control device. 3,908,568, Cl. 112-67.000.
Fujii, Masaru; and Yasunaga, Tatsuhiro, to Sharp Kabushiki Kaisha. Carrier transmission system utilizing commercial power lines as transmission lines. 3,909,618, Cl. 307-3.000.
Fujikura Cable Works, Ltd., The: *See—*
Takaoka, Michio; Oshima, Hiroto; Katsuhara, Toshiharu; Ono, Motoyuki; Sano, Hideo; Seki, Masaichiro; and Hasegawa, Masakazu, 3,909,177.
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Fujiwara, Shohei; and Koike, Susumu. Planar structure semiconductor device and method of making the same. 3,909,319, Cl. 148-187.000.
Fukuda, Hideo: *See—*
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Fulton, Alan William, to Bell Telephone Laboratories, Incorporated. Integrated circuit memory cell. 3,909,807, Cl. 340-173.0FF.
Fuma, Toyoji: *See—*
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Funabashi Kasei Co., Ltd.: *See—*
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Fundingsland, John O. Tape and film cartridge drive means. 3,908,931, Cl. 242-199.000.
Furtado, Anthony E.; Wadsworth, Thomas H.; and Butler, L. Dennis, to Sperry Rand Corporation. Method and apparatus for forming a pair of two and one-half bale wide tier patterns. 3,908,833, Cl. 214-6.00B.
Furukawa Denchi Kabushiki Kaisha: *See—*
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Gacogne, Jean-Marie, to Societe Gamma Electronic. Detector for fumes and combustion gases. 3,909,815, Cl. 340-237.00S.
Gadd, Ronald O. C.; Payne, Sidney H.; and Barton, George C., to USM Corporation. Roll wipers for a shoe lasting machine. 3,908,216, Cl. 12-8.300.
Gaddis, Preston G. Method of making high viscosity aqueous mediums. 3,909,421, Cl. 252-8.55D.
Gai-Tronics Corporation: *See—*
Day, Paul B., 3,909,547.
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Gandino, Mario; and Magnani, Luigi, to Minnesota Mining and Manufacturing Company. Cyanine dye salts, merocyanine dyes, and their use in silver halide photographic emulsions. 3,909,275, Cl. 96-131.000.
Gandrud, Ebenhard S. Speed adjustment control for a fluid motor. 3,908,688, Cl. 137-110.000.
Gannon, Peter F., to Vinyl-Fab Industries. Safety ladder for above-the-ground swimming pools. 3,908,795, Cl. 182-118.000.
Garcia, Alfredo, Jr.: *See—*
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Gardiner, Terence Edward Gouvenot, to Rolls-Royce (1971) Limited. Seal between relatively moving components of a fluid flow machine. 3,908,361, Cl. 60-39.320.
Gardner, Thomas R., to International Business Machines Corporation. Gas panel construction. 3,909,094, Cl. 316-20.000.
Gargrave, Robert J.; and Holiga, Ludomil A., to Dayton Progress Corporation. Apparatus for mounting a tool holder or like assembly to a backing structure. 3,908,500, Cl. 83-700.000.
Garini, Richard A.: *See—*
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Garlock Inc.: *See—*
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Garn, Ole; and Corlin, Arne, to Aktieselskabet Jens Villadsens Fabriker. Plastic sheet materials and structures containing the same. 3,909,144, Cl. 404-31.000.
Garnett, George William, to Imperial Chemical Industries Limited. Control of dust during discharge of materials into hoppers. 3,908,720, Cl. 141-93.000.
Garrett Corporation, The: *See—*
Jansen, Harvey B.; and Adams, Milton R., 3,909,159.
Garrett, Wylie P. Drill collar incorporating device for jetting drilling fluid transversely into bore hole. 3,908,771, Cl. 175-393.000.
Garrick, George R.: *See—*
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Gartner, William Joseph, to Gartner Research & Development Co. Water purification device. 3,909,402, Cl. 210-27.000.

Gates, Harris Gordon, to Gates & Sons, Inc. Concrete pouring form panel. 3,908,956, Cl. 249-40.000.

Gates & Sons, Inc.: *See*—
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Gauge, Thomas P.; Kocsis, Joseph; and Buchanan, James R., to Signetics Corporation. Method for forming MOS structure using double diffusion. 3,909,320, Cl. 148-187.000.

Gauley, Isiah Sherman: *See*—
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Gazzano, Donald J., to Ampex Corporation. Circuit for enhancing resolution in tachometer signals. 3,909,717, Cl. 324-166.000.

Geary, Frederick J., to U.S. Industries, Inc. Control system for animal feeder. 3,908,601, Cl. 119-52.0AF.

Gebruder Junghans GmbH: *See*—
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Gee, John F.: *See*—
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GEHL Company: *See*—
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Geier, Bernd: *See*—
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Geier, Georg, to Westinghouse Bremsen-und Apparatebau GmbH. Protection circuitry for monitoring a vehicle wheel anti-skid and/or anti-spin control apparatus. 3,909,072, Cl. 303-21.0AF.

Geier, Heinz: *See*—
Friese, Karl-Hermann; and Geier, Heinz, 3,909,459.

Gely, Michel Albert, to Kores Holding Zug AG. Typewriter ribbon spool having congruent halves formed of plastic and metal. 3,908,819, Cl. 197-175.000.

Gem Industries, Inc.: *See*—
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Gemmill, Robert George, to Du Pont of Canada, Limited. Injection moulding runner and process. 3,909,175, Cl. 425-242.00R.

Gener, Jean-Jacques: *See*—
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General Bathroom Products Corporation: *See*—
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General Electric Company: *See*—
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Betts, Joseph E.; and Vostovich, Joseph E., 3,909,507.
Busian, Vincent V., 3,909,642.
Ferro, Armand P., 3,909,700.
Harris, Lawrence A., 3,909,741.
Jacobus, Dwight W., 3,908,394.
Lever, Ray Clarence; and Wilkus, Edward Vincent, 3,909,486.
Little, Ward Arthur, 3,908,869.
Mark, Victor, 3,909,490.
Meagher, George L., 3,909,045.
Ouellette, Ronald J.; Canney, Robert S.; and Stetson, Ralph B., 3,909,759.
Salt, Trevor L., 3,908,447.
Schimke, Thomas O.; and Cushing, Donald S., 3,908,681.
Schumacher, Frank A., 3,908,392.
Sulcs, Juris; Jennings, David L.; and Garrick, George R., 3,909,660.
Woods, Lee O., 3,909,768.
Yerman, Alexander J., 3,909,332.

General Electric Company Limited, The: *See*—
Lawrence, Gerald Norman, 3,909,786.

General Foam Plastics Corporation: *See*—
Chase, Ascher, 3,908,205.

General Instrument Corporation: *See*—
Friberg, Vincent P.; and Chesney, John, 3,908,264.

General Motors Corporation: *See*—
Kramer, Friedhelm; and Brunk, Klaus, 3,909,058.

General Public Utilities Corporation: *See*—
Jagoda, Neil H.; Kubierschky, Klaus; and Baker, Howard S., 3,909,821.

General Signal Corporation: *See*—
Sibley, Henry C., 3,909,632.
Young, John E. G., 3,908,375.

General Tire & Rubber Company, The: *See*—
Jellison, Frank R., 3,909,335.

Gentiluomo, Joseph A. Centerless thick-walled game ball. 3,908,993, Cl. 273-60.00R.

George, Harvey F.; Oppenheimer, Robert H.; Marrara, Charles G.; and Cairns, David W., to Gravure Research Institute, Inc. Method and apparatus for detecting skips in gravure printing. 3,909,138, Cl. 356-237.000.

George, Robert F.; and Lawrence, Peter, to Lawrence, Simone P. Chair base construction. 3,908,946, Cl. 248-188.700.

Geo. W. Bollman & Co., Inc.: *See*—
Heisey, Willis A., 3,909,407.

Georgetown Steel Corporation: *See*—
Paletzki, Hans Joachim, 3,908,712.

Gerard, Claude: *See*—
Bellisai, Giorgio; Lemaire, Guy; and Gerard, Claude, 3,908,883.

German, Roman Anatolievich: *See*—
Onikov, Eduard Arshakovich; Zabotin, Alexandr Alexandrovich; Lileev, Valeryan Petrovich; Rutkevich, Zinovy Yakovlevich; Sakharov, Boris Alexandrovich; and German, Roman Anatolievich, 3,908,706.

Gerry, Julian E. Navigational aid. 3,908,274, Cl. 33-1.0SD.

Gertisser, Berthold, to Sandoz Ltd. Stable liquid dyestuff preparations. 3,909,192, Cl. 8-90.000.

Gertsch AG: *See*—
Gertsch, Ulrich; and Gertsch, Ernst, 3,909,025.

Gertsch, Ernst: *See*—
Gertsch, Ulrich; and Gertsch, Ernst, 3,909,025.

Gertsch, Ulrich; and Gertsch, Ernst, to Gertsch AG. Releasable ski binding. 3,909,025, Cl. 280-11.35K.

Gesell, Hartmut: *See*—
Findeisen, Gerhard; Dautzenberg, Norbert; and Gesell, Hartmut, 3,909,239.

Getchell, Nelson F.; Hollies, Norman R. S.; and Stanton, Samuel S., to Cotton Incorporated. Apparatus for the continuous treatment of an advancing web. 3,908,408, Cl. 68-5.00E.

Getson, Edward F., Jr.: *See*—
Recks, John A.; Cassarino, Frank V., Jr.; Getson, Edward F., Jr.; Laubscher, Karl F.; McLaughlin, Albert T.; and Pinheiro, Edwin J., 3,909,799.

GF Business Equipment, Inc.: *See*—
Breckner, Gerald; Terlecki, Leo; Goulish, Gabriel; and Costello, James, 3,909,090.

GFE Gesellschaft fur Entstaubungstechnik AG: *See*—
Schmidt, Reinhold, 3,909,223.

Ghosh, Suhas; and Wicnienski, Michael Francis, to Wescom, Inc. Procedure and apparatus for locating faults in digital repeatered lines. 3,909,563, Cl. 179-175.31R.

Giannelli, Roberto. Apparatus for packing plastic bags with contents of constant and preselected weight and operating in a continuous and automatic cycle. 3,908,335, Cl. 53-138.00A.

Gibbard, David William, to Image Analysing Computers Limited. Electron beam specimen analysis. 3,909,612, Cl. 250-307.000.

Gibbs, Charles H.: *See*—
Derda, Harry J.; and Gibbs, Charles H., 3,908,271.

Giberstein, Bernard, to Dim-Rosy. Device for packaging and presentation of knitted or hosiery articles such as, more particularly, stockings or tights. 3,908,822, Cl. 206-278.000.

Gilles, Jack C., to B. F. Goodrich Company, The. Hydroxyphenylalkyleneyl isocyanurate/thiophosphite combinations as stabilizers for organic materials. 3,909,491, Cl. 260-45.8NT.

Gilles, Jack C., to B. F. Goodrich Company, The. Aliphatic esters of carboxymethene- and carboxyethenethiosuccinic acid. 3,909,493, Cl. 260-45.70S.

Gilliams, Yvan Karel; Van Engeland, Jozef Leonard; and De Volder, Noel Jozef, to Agfa-Gevaert N.V. Liquid electrophotographic developing compositions. 3,909,433, Cl. 252-62.100.

Gilmore, Guy T., to Multi-Fab, Inc. Flange facing and cutting tool. 3,908,491, Cl. 82-4.00C.

Giolfo, Mario. Anchor particularly suitable for small boats. 3,908,575, Cl. 114-206.00R.

Gish, Herbert: *See*—
Bussgang, Julian J.; and Gish, Herbert, 3,909,721.

Givaudan Corporation: *See*—
Gubler, Bernhard, 3,909,462.

Gladwin Industries, Inc.: *See*—
Nix, Walter E., 3,908,954.

Glaskov, Ilya Mikhailovich; Zaitsev, Valentin Andreevich; Kuzhelev, Valentin Ivanovich; Raikhman, Yakov Aronovich; and Svidelsky, Arnold Petrovich. Microphotocomposing apparatus for making artworks. 3,909,130, Cl. 355-40.000.

Glass, Marvin I.: *See*—
McKay, Robert S.; Breslow, Jeffrey D.; and Glass, Marvin I., 3,908,303.

Glaum, Gerald Vernon: *See*—
Ryan, Peter John; Glaum, Gerald Vernon; and Walli, Einar, 3,909,248.

Glen, John Barrington: *See*—
Coldrey, Peter Wallace; and Glen, John Barrington, 3,909,249.

Glenat, Henri: *See*—
Grescini, Jean; Glenat, Henri; and Salvi, Anteine, 3,909,706.

Global Marine Inc.: *See*—
Blurton, Leon C.; and Cina, Saverio J., 3,908,784.

Globol-Werk GmbH: *See*—
Von Philipp, Fritz; and Schimanski, Georg, 3,908,905.

Glory Kogyo Kabushiki Kaisha: *See*—
Abe, Masahiro, 3,908,982.
Hatanaka, Yoshihiro; Shigemori, Hideto; and Ueba, Akio, 3,908,894.
Ushio, Masatoshi, 3,908,338.

Goben, Kenneth W., to United States of America, Navy. Shock attenuating structure. 3,908,951, Cl. 248-358.00R.

Godfrey, Arthur W.: *See*—
Crawford, Wheeler C.; and Godfrey, Arthur W., 3,909,425.

Goehre, Otto: *See*—
Friedrichsen, Wilhelm; and Goehre, Otto, 3,909,457.

Goetchius, Ronald James: *See*—
Collins, Michael John; Cruse, Bernard William, Jr.; and Goetchius, Ronald James, 3,909,598.

Goff, Richard Everett, Jr.; and Guay, Normand Daniel, to Johnson & Johnson. Narrow elastic waistband fabric and method of manufacturing the same. 3,908,711, Cl. 139-419.000.

Goffe, William L.; and Brown, George A., to Xerox Corporation. Imaging migration member employing a gelatin overcoating. 3,909,262, Cl. 96-1.500.

Goodhue, Charles T.; and Risley, Hugh A., to Eastman Kodak Company. Method for the preparation of cholesterol oxidase. 3,909,359, Cl. 195-.

Goodyear Aerospace Corporation: *See*—
Bartucci, John F., 3,909,523.

Goodyear Tire & Rubber Company, The: *See*—
Callander, Douglas D., 3,909,489.
Griffin, Theodore F.; Hunter, Edward E.; and Rye, Grover W., 3,908,585.

Goransson, Bertil Henry: *See*—
Fagerstrom, Kurt Gunnar; Goransson, Bertil Henry; and Hellstrom, Per-Olov, 3,908,533.

Gordon, Jerry Dale. Apparatus for receiving articles for immersion into a fluid for cooking. 3,908,535, Cl. 99-426.000.

Gordon, Robert Louis, to International Paper Company. Single piece carton with sloped bottom and exterior seals. 3,908,888, Cl. 229-16.00A.

Gordy, Robert S.: *See*—
Anderson, Alfred T.; Gordy, Robert S.; and Sanders, David E., 3,909,735.

Gorman, Timothy H. Casting decorative articles. 3,908,239, Cl. 24-163.00K.

Gorton, Howard B.: *See*—
Read, George D.; and Gorton, Howard B., 3,908,226.

Goss, Gary J.; Kelly, Richard P.; and Miu, Ming T., to Honeywell Information Systems Inc. Data processing system utilizing control store unit and push down stack for nested subroutines. 3,909,797, Cl. 340-172.500.

Goss, Lorane C., Jr.; Cribben, James T.; and Miller, Joseph J., to Capitol Products. Storm window. 3,908,730, Cl. 160-90.000.

Goss, Wilbur H.; Porter, Henry H.; Roberts, Richard B.; Tuve, Merle Antony; Beams, Jesse W.; and Selvidge, Harner, to United States of America, Navy. Guided missile. 3,908,933, Cl. 244-3.210.

Gosswiller, Earl W., to Federal Sign and Signal Corporation. Loudspeaker with shallow re-entrant grille-like horn. 3,909,530, Cl. 179-1.00E.

Gotaverkin Oresundsvarvet AB: *See*—
Hakansson, Erik, 3,908,443.

Gotoda, Masao; Yokoyama, Kenji; Kono, Yoshimi; Toyonishi, Shigekazu; Hiwano, Kunio; and Shimoyama, Takaitsu, to Japan Atomic Energy Research Institute. Resin-forming composition and use thereof. 3,909,379, Cl. 204-159.220.

Gottfried, Arthur H.: *See*—
Baker, Halsted W.; and Gottfried, Arthur H., 3,909,651.

Gottwald, Antonin, to Double Check Industries, Inc. Keg closure and coupler assembly. 3,908,871, Cl. 222-400.700.

Gould Inc.: *See*—
Bruzas, John A.; and Coville, William E., 3,908,738.
Cushman, Robert Holbrook, 3,908,739.
Keizer, Alan S., 3,908,741.
Kruper, Wayne A.; and Kingsbury, George R., 3,909,209.
Schenk, Raymond L., Jr.; and Keizer, Alan S., 3,908,740.
Schenk, Raymond L., Jr.; Cushman, Robert Holbrook; and Keizer, Alan S., 3,908,742.
Schenk, Raymond L., Jr.; and Bruzas, John A., 3,908,743.
Schenk, Raymond L., Jr.; and Hayes, William B., 3,909,300.
Schenk, Raymond L., Jr., 3,909,301.

Goulish, Gabriel: *See*—
Breckner, Gerald; Terlecki, Leo; Goulish, Gabriel; and Costello, James, 3,909,090.

Gowland, Cyril James. Fastening device. 3,908,240, Cl. 24-166.000.

Grabenhorst, Dieter: *See*—
Oni, Helmut; and Grabenhorst, Dieter, 3,908,345.

Grabowski, Alexander I.: *See*—
Roepke, Wallace W.; and Grabowski, Alexander I., 3,908,977.

Graff, William R., to Simplimatic Engineering Co. Apparatus for packing either 25 or 26 bottles into a container. 3,908,812, Cl. 198-22.00B.

Graham, Kenneth Z.: *See*—
Harben, Grover S., Jr.; and Graham, Kenneth Z., 3,908,229.

Graham Magnetics Incorporated: *See*—
Deffeyes, Robert J.; and Tyler, Wesley R., 3,909,240.

Gram, Martin M., to MTS Systems Corporation. Hydraulic servo valve controlled cupping press. 3,908,429, Cl. 72-349.000.

Granholm, Lars E., to Outboard Marine Corporation. Slide rule for computing motor boat performance. 3,908,895, Cl. 235-70.00A.

Grant, Philip J.: *See*—
Pittet, Rene E., Jr.; and Grant, Philip J., 3,909,075.

Grant, Samuel Edward: *See*—
Bush, Thomas P., Jr.; and Grant, Samuel Edward, 3,908,495.

Graves, Herbert Kenneth; and Bessette, Andrew Paul, to Xerox Corporation. Lens scan mechanism. 3,909,103, Cl. 350-6.000.

Graves, Richard M.: *See*—
Chapman, Paul W.; Graves, Richard M.; and Sasse, Henry C., III, 3,908,219.

Gravure Research Institute, Inc.: *See*—
George, Harvey F.; Oppenheimer, Robert H.; Marrara, Charles G.; and Cairns, David W., 3,909,138.

Gray, Bruce H.: *See*—
Dunn, Robert M.; and Gray, Bruce H., 3,909,597.

Gray, Russell Houston, to Du Pont de Nemours, E. I., and Company. Colorants for photopolymerized images. 3,909,282, Cl. 106-288.00Q.

Graziano, Ronald M., to Engler Instrument Company. Electric timepiece drive. 3,908,353, Cl. 58-23.00A.

Greencastle Metal Works: *See*—
Duffield, Cedric A., 3,908,844.

Greenhut, Bart E., to Impact-O-Graph Corporation. Impact monitor or shock indicator. 3,909,568, Cl. 200-61.450.

Greenwell, Joseph L. Injection tube assembly and concrete panel form. 3,909,168, Cl. 425-129.000.

Gregory, Derek P., to Institute of Gas Technology. Catalytic ignition system. 3,909,187, Cl. 431-268.000.

Grescini, Jean; Glenat, Henri; and Salvi, Anteine, to Commissariat a l'Energie Atomique. Method for measuring a rotational velocity and a gyrometer for the practical application of said method. 3,909,706, Cl. 324-.50E.

Gresens, Robert I., to Eastman Kodak Company. Adjustable drive mechanism for a motion picture camera. 3,908,930, Cl. 242-197.000.

Gretag Aktiengesellschaft: *See*—
Willimann, Louis Sepp, 3,909,533.

Gretsky, Jury Yakovlevich: *See*—
Asnis, Avraam Efimovich; Gretsky, Jury Yakovlevich; Kuznetsov, Evgeny Petrovich; Slavinsky, Nikolai Alexandrovich; and Melnichenko, Igor Mikhailovich, 3,909,253.

Grewing, Chester H. Automatic water level keeper for swimming pools. 3,908,206, Cl. 4-172.170.

Griffin, James L.: *See*—
Rossi, Joseph R.; Griffiths, Frederick J.; Griffin, James L.; and Palleson, Gormen C., 3,908,593.

Griffin, Paul D. Protective heat shield. 3,908,197, Cl. 2-20.000.

Griffin, Theodore F.; Hunter, Edward E.; and Rye, Grover W., to Goodyear Tire & Rubber Company, The. Apparatus using superheated vapor for drying solvent-treated tire cord fabric. 3,908,585, Cl. 118-48.000.

Griffith, Michael J.: *See*—
Miller, George E.; and Griffith, Michael J., 3,908,579.

Griffiths, Frederick J.: *See*—
Rossi, Joseph R.; Griffiths, Frederick J.; Griffin, James L.; and Palleson, Gormen C., 3,908,593.

Griffolyn Company, Inc.: *See*—
Evett, Herschel Lee, 3,908,582.
Newcomb, Morton Austin; and Bjorksten, Johan A., 3,908,901.

Grimmett, Michael Charles; and Crawley, Douglas Gerald, to Thorn Electrical Industries Limited. Cathode ray tube having cylinder with internal resistive helix. 3,909,655, Cl. 313-450.000.

Grob, Alfred: *See*—
Hans, Waldemar; Staib, Helmut; and Grob, Alfred, 3,909,758.

Grolet, Pierre: *See*—
Bournazel, Claude; Chatard, Michel; and Grolet, Pierre, 3,908,703.

Grossenbacher, Robert E. Electronic control for automobile lights. 3,909,661, Cl. 315-82.000.

Grundy, Gary L.; Steiner, David C.; Gutzmann, Gerard C.; and Krueger, Ralph G., to United States of America, Air Force. Radiation hardened sense amplifier for thin film memory applications. 3,909,739, Cl. 330-33.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Chang, Gregory I.; Buhrke, Rolfe E.; Schulte, Donald L.; and Wilber, John A., 3,909,795.
Fuchs, Siegfried H., 3,909,545.
Lee, David Q.; and Srivastava, Dinesh K., 3,909,822.
Marshall, Richard A., 3,909,551.
Marshall, Richard A., 3,909,553.
Wunluck, Bruce R.; Draayer, Johannes; Young, John S.; Van Bosse, John G.; and Douglas, Robert P., 3,909,542.

GTE International Incorporated: *See*—
Taylor, Michael Geoffrey Cleeve, 3,909,559.

GTE Sylvania Incorporated: *See*—
Cheney, Richard F.; Mower, Frederick J.; and Moscatello, Charles L., 3,909,241.
Roy, Joseph A.; and Bradway, Gary C., 3,908,251.
Shaffer, Francis N.; Palumbo, Dominic T., deceased; and Palumbo, Frances A., administratrix, 3,909,443.

Guay, Normand Daniel: *See*—
Goff, Richard Everett, Jr.; and Guay, Normand Daniel, 3,908,711.

Gubler, Bernhard, to Givaudan Corporation. Novel odorant and/or flavorant. 3,909,462, Cl. 260-562.00R.

Gulf & Western Manufacturing Company: *See*—
Johnson, Earl Willard; Ringler, John Sherman; and Hook, Bernard K., 3,908,572.

Gulf & Western Manufacturing Company (Michigan): *See*—
Snidar, Edward A.; Gaines, Donald R.; and Trudeau, William H., 3,909,084.

Gullfiber AB: *See*—
Lundin, Tord Rune, 3,908,200.

Gurklis, John A.: *See*—
Faust, Charles L.; and Gurklis, John A., 3,909,388.

Gustafsson, Anders Christer: *See*—
Hallnor, Georg; and Gustafsson, Anders Christer, 3,909,080.

Gustav Schade Maschinenfabrik: *See*—
Strocker, Gunter, 3,908,837.

Guth, Eugene D.: *See*—
Diaz, Arthur F.; and Guth, Eugene D., 3,909,211.

Guthrie, Robert M.; and Straley, George L., to Fastener Engineers, Inc. Apparatus for feeding and unreeling wire from a coil. 3,908,922, Cl. 242-54.00R.

Guthry, Joe M. Combination camper and boat trailer mechanism. 3,909,057, Cl. 296-23.00B.

Guttinger, Manfred: *See—*
Bauer, Kunibert; and Guttinger, Manfred, 3,909,711.

Gutzmann, Gerard C.: *See—*
Grundy, Gary L.; Steiner, David C.; Gutzmann, Gerard C.; and Krueger, Ralph G., 3,909,739.

Gzemski, Felix C.: *See—*
Borchert, Alfred E.; Condo, Albert C.; Gzemski, Felix C.; McGrogan, John F.; and Wilbur, Benjamin C., 3,909,474.

H. B. Zachry Co.: *See—*
Cox, Elmer Adrian; Tiner, Wayne Douglas; and Woods, Ritchey Paul, Jr., 3,908,321.

Haag, Albrecht, to Keinzle Uhrenfabriken GmbH. Bell tone apparatus for a clock. 3,908,352, Cl. 58-9.000.

Haas, Werner E. L.; and Adams, James E., to Xerox Corporation. Variable spherulitic diffraction. 3,909,114, Cl. 350-160.0LC.

Haberle, Karl-Heinz: *See—*
Schmidt, Peter; and Haberle, Karl-Heinz, 3,909,124.

Habiger, Cyril W., to Caterpillar Tractor Company. Hydrostatic drive arrangement. 3,908,374, Cl. 60-420.000.

Hagie Manufacturing Company: *See—*
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Haiss, Hermann S.: *See—*
Chang, Marguerite S.; Whitman, Charles L.; Haiss, Hermann S.; and Highby, John H., 3,909,322.

Hakansson, Erik, to Gotaverkin Oresundsvarvet AB. Method and a device for detecting contaminants in process water. 3,908,443, Cl. 73-61.10R.

Hakozaki, Shori: *See—*
Nakagawa, Yunosuke; Hakozaki, Shori; and Sato, Koitsu, 3,909,438.

Halcon International, Inc.: *See—*
Schmidt, John P.; and Garcia, Alfredo, Jr., 3,909,366.

Hall, David Wilson, II, to Motorola, Inc. Wide bandwidth solid state input buffer. 3,909,633, Cl. 307-268.000.

Hall, Edward C., to Owens-Corning Fiberglas Corporation. Apparatus for treating sheet material. 3,908,591, Cl. 118-308.000.

Hallnor, Georg; and Gustafsson, Anders Christer, to SKF Industrial Trading and Development Company, B.V. Hydrostatic bearing. 3,909,080, Cl. 308-9.000.

Halverson, Doel. Method for maintaining health of confined mink. 3,908,600, Cl. 119-51.00R.

Hambrick, Lester N.; and Flowers, Carl C. Rail base grinding apparatus. 3,908,317, Cl. 51-178.000.

Hamill, Arthur Lee: *See—*
Henderson, Thomas A.; and Hamill, Arthur Lee, 3,908,555.

Hamilton, David Michael: *See—*
Telliard, Gregory Alan; Hamilton, David Michael; and Chaplin, Gary Edward, 3,908,235.

Hammarstedt, Curt Lennart. Silencer and flow regulator particularly for water conduits. 3,908,788, Cl. 181-33.00S.

Hammond, John Edward; and Williams, Alan, to Joseph Lucas (Industries) Limited. Method of manufacturing battery plate grids. 3,909,293, Cl. 136-36.000.

Hammond, William D., to L & R Industries. Air gun mechanism arrangement. 3,908,626, Cl. 124-15.000.

Hamon, Emile F.: *See—*
Delgendre, Jacques C.; Hamon, Emile F.; and Berton, Georges A., 3,909,567.

Hampton, Christopher James: *See—*
Bowman, Miles Augustus, Jr.; Hampton, Christopher James; and Schock, Paul Henry, 3,908,435.

Handa, Ryoji: *See—*
Hongo, Masafumi; Handa, Ryoji; and Kamada, Kazumasa, 3,909,485.

Handrich, Marc A., to Institut de Programmatique et de Cybernetique, a part interest. Method and apparatus for seeking information recorded on a moving mass storage unit. 3,909,793, Cl. 340-172.500.

Haning, James O.; Kool, Bram; Moritz, Jules G.; and Mizrahi, Robert, to Microform Data Systems, Inc. Film strip handling apparatus and method. 3,909,122, Cl. 353-26.000.

Hannahan, William F., to Champion Company, The. Embalming apparatus. 3,908,246, Cl. 27-24.00R.

Hans, Waldemar; Staib, Helmut; and Grob, Alfred, to Robert Bosch G.m.b.H. Solenoid valve. 3,909,758, Cl. 335-255.000.

Hanselman, Paul N.: *See—*
Lambert, Gray; and Hanselman, Paul N., 3,908,821.

Hanss, Paul, to Elba Werk, Maschinen-Gesellschaft mbH & Co. Dragline conveyor. 3,908,838, Cl. 214-10.000.

Harada, Yutaka: *See—*
Masaki, Akira; and Harada, Yutaka, 3,909,636.

Harbage, Alfred B., to United States of America, Navy. Torsionally and/or axial soft coupling. 3,908,401, Cl. 64-27.0NM.

Harben, Grover S., Jr.; and Graham, Kenneth Z., to Gainesville Machine Co., Inc. Vacuum eviscerator apparatus and method. 3,908,229, Cl. 17-11.000.

Harbor Industries Incorporated: *See—*
Skrzelowski, David S., 3,908,830.

Hardy, John F.: *See—*
Economou, Peter; Hardy, John F.; and Renner, Alfred, 3,909,348.

Harner, Robert H.; and Tobin, Thomas J., to S and C Electric Company. High voltage circuit interrupter switch arrangement. 3,909,570, Cl. 200-144.00C.

Harris, Clyde W.: *See—*
Neiswander, Robert S.; and Harris, Clyde W., 3,909,105.

Harris, Dewey F., to Kaman Sciences Corporation. Phase stable transmission cable with controlled thermal expansion characteristics. 3,909,555, Cl. 174-102.00P.

Harris, Edward M.: *See—*
Parker, Edward H.; Harris, Edward M.; and Meador, Jim D., 3,909,269.

Harris, George Jerry; and DePedro, Donald, to American Optical Corporation. Electrocardiographic review system. 3,909,792, Cl. 340-172.500.

Harris, Lawrence A., to General Electric Company. Acoustic transducer with direct current output. 3,909,741, Cl. 330-5.500.

Harris, Marvin K. Articulated vehicle with trench filler and tamper. 3,908,292, Cl. 37-142.500.

Harrison, Gene C. Method and apparatus for displaying decals. 3,908,296, Cl. 40-210.000.

Hart, Burt E., to International Business Machines Corporation. Switching voltage regulator with optical coupling. 3,909,702, Cl. 323-17.000.

Hartkamp, Heinrich; and Nitz, Gerhard, to Landesanstalt fur Immissions und Bodennutzungsschutz des Landes Nordrhein-Westfalen. Metering of trace amounts of fluids for producing low concentrations thereof in carrier fluids. 3,908,696, Cl. 137-604.000.

Hartman, Donn Allan: *See—*
Cloud, Charles E.; and Hartman, Donn Allan, 3,908,979.

Hartman, Paul F., to Allied Chemical Corporation. Grafted block copolymers of synthetic rubbers and polyolefins. 3,909,463, Cl. 260-2.50F.

Hartmann, Franz, to Nordischer Maschinenbau Rud. Baader. Process and apparatus for filleting fish. 3,908,230, Cl. 17-57.000.

Harvey, Robert R., to Phillips Petroleum Company. Method of treating petroleum-bearing formations for supplemental oil recovery. 3,908,764, Cl. 166-305.00R.

Hasegawa, Masakazu: *See—*
Takaoka, Michio; Oshima, Hiroto; Katsuhara, Toshiharu; Ono, Motoyuki; Sano, Hideo; Seki, Masaichiro; and Hasegawa, Masakazu, 3,909,177.

Haselgrove, Bob; and Nichol, John Derek, to Detexomat Machinery Limited. Hosiery Manufacture. 3,908,874, Cl. 223-43.000.

Hata, Toju; Omura, Satoshi; Katagiri, Michiko; Awaya, Juichi; Kuyama, Shimpei; Higashikawa, Shizuo; Yasui, Kazuomi; and Terada, Haruko, to Nihon Tokushu Noyaku Seizo Kabushiki Kaisha and Kitasato Institute, The. Novel antifungal antibiotic substance, process for production of the same, and agricultural and horticultural fungicidal composition containing said substance. 3,909,361, Cl. 195-80.00R.

Hatanaka, Yoshihiro; Shigemori, Hideto; and Ueba, Akio, to Glory Kogyo Kabushiki Kaisha. Automatic money-dispensing system. 3,908,894, Cl. 235-61.60R.

Hatano, Tadao: *See—*
Iwano, Haruhiko; Shirasu, Kazuo; and Hatano, Tadao, 3,909,267.

Haury, Vernon E.: *See—*
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Hauser, Raimund: *See—*
Holler, Hermann; and Pammer, Gottfried, 3,909,841.

Hawaiian Sugar Planters' Association: *See—*
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Hawkins, Royal R., to Honeywell Inc. Floating position proportional control system. 3,908,765, Cl. 172-4.500.

Hawthorne, Ralph W. Adjustable container support. 3,908,948, Cl. 248-223.000.

Hayashi, Tadashi: *See—*
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Haydon, Arthur W., to Tri-Tech, Inc. Electric rotating machine. 3,909,646, Cl. 310-83.000.

Hayes, John C., to Universal Oil Products Company. Catalytic reforming with a catalyst containing platinum or palladium and ruthenium. 3,909,394, Cl. 208-139.000.

Hayes, William B.: *See—*
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Long, Leslie T., 3,908,622.

Hayward, Norman G. Ball ended push rod with controlled oil flow. 3,908,615, Cl. 123-90.350.

Heagy, John Franklin, to RCA Corporation. Production of lead monoxide coated vidicon target. 3,909,308, Cl. 148-1.500.

Hearon, William Montgomery: *See—*
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Heckmann, Werner: *See—*
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Hefter, Murray: *See—*
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Heil, Werner; and Moser, Heinrich, to Aktiengesellschaft Brown, Boveri & Cie. Method of making commutator structure for the rotor of a dynamo-electric machine. 3,908,265, Cl. 29-597.000.

Heine, Henry; and Feinberg, Irving, to Presto Lock Company, Division of Walter Kidde & Company, Inc. Latching device. 3,908,416, Cl. 70-71.000.

Heinrich Wunder, KG: *See—*
Zoor, Reinhold, 3,909,023.

Heintz, Richard P., to Pneumo Dynamics Corporation. Aircraft duplex system. 3,908,935, Cl. 244-83.00E.

Heisey, Willis A., to Geo. W. Bollman & Co., Inc. Treatment of wool scouring wastes. 3,909,407, Cl. 210-49.000.

Hellstrom, Per-Olov: *See*—
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Helzer, Russell H. Rod forming mechanism. 3,908,433, Cl. 72-388.000.

Henderson, Thomas A.; and Hamill, Arthur Lee, to Hytrac Conveyors Limited. Conveyor track switch. 3,908,555, Cl. 104-130.000.

Hendry, Dale G.; Hill, Marion E.; and Peters, Howard M., to Stanford Research Insitute. Solid polymers thermally degradable to flowable compositions. 3,909,497, Cl. 260-77.50A.

Henke, Arthur W.: *See*—
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Henry, Walton M.: *See*—
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Henzel, George M.; and Henzel, John H. Trailer hitch. 3,909,044, Cl. 280-432.000.

Henzel, John H.: *See*—
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Hepworth & Grandage Limited: *See*—
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Heritage Silversmiths Limited: *See*—
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Hermanns, Peter, to FMN Schuster & Co. Casing for a winding apparatus. 3,908,919, Cl. 242-43.000.

Hermanns, Peter, to FMN Schuster & Co. Process and apparatus for maintaining constant thread tension. 3,908,920, Cl. 242-45.000.

Herold, Stanley J.: *See*—
Beatty, Bobby D.; Herold, Stanley J.; LaGrange, Donald E.; and Sanders, David K., 3,908,550.

Herr, John A.; and Jaffe, Wolfgang, to Singer Company, The. Permanent magnet motor-tachometer having a single non-ferrous armature wound with two mutually-insulated windings each connected to a separate commutator. 3,909,645, Cl. 310-138.000.

Hervert, George L.: *See*—
Spielberg, David H.; Svacha, Roy E.; Janowski, Kenneth R.; and Hervert, George L., 3,909,385.

Herz, Arthur H., to Eastman Kodak Company. Photographic elements, compositions and processes. 3,909,272, Cl. 96-114.500.

Hess, Johann, to Robert Bosch G.m.b.H. Impact wrench. 3,908,766, Cl. 173-12.000.

Hess, Johann, to Robert Bosch G.m.b.H. Rotary impact tool. 3,908,768, Cl. 173-93.000.

Hessert, James E.; and Clampitt, Richard L., to Phillips Petroleum Company. Gelled polymers and methods of preparing same. 3,909,423, Cl. 252-8.55D.

Hessert, James E.: *See*—
Clampitt, Richard L.; and Hessert, James E., 3,908,760.

Heuer, Dale Arthur: *See*—
Cochran, William Hugh; Heuer, Dale Arthur; and Sheehan, Michael James, 3,909,808.

Hewitt, Donald C.: *See*—
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Hewlett-Packard Company: *See*—
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Hicks, John R., to Applied Power, Inc. Wedge anchoring device. 3,908,961, Cl. 254-51.000.

Hieronymus, Wilhelm, to Sphere Investments Limited. Method and apparatus for handling irregular objects. 3,908,814, Cl. 198-34.000.

Higashikawa, Shizuo: *See*—
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Hill, John; and Turczanski, Henry, to Comtelco (U.K.) Limited. Reed switch manufacture. 3,908,266, Cl. 29-622.000.

Hill, Marion E.: *See*—
Hendry, Dale G.; Hill, Marion E.; and Peters, Howard M., 3,909,497.

Hill, Robert S., to Wurlitzer Company, The. Numerical controlled bandsaw for keyboards. 3,908,723, Cl. 144-2.00R.

Hille Engineering Company Limited: *See*—
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Hinachi, Matatoyo: *See*—
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Hindersinn, Raymond R.; and Selley, Jeffrey E., to Hooker Chemicals & Plastics Corporation. Tack free polymerizable polyester compositions. 3,909,483, Cl. 260-40.00R.

Hirata, Hiromasa, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method for annealing of strip coils. 3,909,316, Cl. 148-156.000.

Hirose, Tadatsugu: *See*—
Andoh, Shizuo; Urade, Toshinori; Hirose, Tadatsugu; and Shirouchi, Yasunari, 3,909,665.

Hirsbrunner, Hans G.; Plouffe, Leo A.; and McBride, Lyle E., Jr., to Texas Instruments Incorporated. Protection circuit. 3,909,675, Cl. 317-41.000.

Hirschle, Werner; Rutz, Hans; and Wurmli, Arthur, to Rieter Machine Works, Ltd. Bobbin tube loading apparatus. 3,908,348, Cl. 57-53.000.

Hitachi Chemical Company, Ltd.: *See*—
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Kaji, Tetsunori; and Mizushima, Masashi, 3,909,804.
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Hobbs, Alan James. Device for dispensing ice. 3,908,395, Cl. 62-346.000.

Hobson, John Douglas; and Lomas, Teddie Ward, to Dunford Hadfields Limited. Analysis of metals. 3,909,133, Cl. 356-86.000.

Hochiki Corporation: *See*—
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Hodge, Thomas, Jr. Mounting arrangement for a lamp. 3,909,100, Cl. 339-52.00S.

Hoechst Aktiengesellschaft: *See*—
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Berg, Leo; Lenemann, Erhard Johann; and Kinneging, Johannes Wilhelmus, 3,908,719.
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Hoerner Waldorf Corporation: *See*—
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Hoffman, Richard C., to Allatt Limited. Paving machine. 3,909,146, Cl. 404-110.000.

Hoffmann, Lothar: *See*—
Muller, Frank; and Hoffmann, Lothar, 3,908,829.

Hofmann, Judson A., to Zenith Radio Corporation. Coincidence gated AGC for a television receiver. 3,909,522, Cl. 178-7.30R.

Hofmann, Karl; and Mladek, Walter, to Robert Bosch G.m.b.H. Fuel injection nozzle for internal combustion engines. 3,908,911, Cl. 239-533.000.

Hogue, Norman E., to Packard Industries, Inc. Movable wall partition including shelf or similar object supporting brackets. 3,908,320, Cl. 52-36.000.

Hohmann, Robert C., to S.J. Agnew, Agnew Environmental Products. Article dispensing apparatus. 3,908,859, Cl. 221-118.000.

Hohn, Richard Edward, to Cincinnati Milacron, Inc. Method and apparatus for controlling an automation along a predetermined path. 3,909,600, Cl. 235-151.110.

Holden, Russell L.: *See*—
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Holiga, Ludomil A.: *See*—
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Holler, Hermann; and Pammer, Gottfried, to Vockenhuber, Karl; and Hauser, Raimund. System for controlling the recording and reproduction of messages. 3,909,841, Cl. 360-3.000.

Holliday, Robin David; and McIntosh, Peter, to Conzinc Riotinto of Australia Limited. Electrolytic process for the production of metals in molten halide systems. 3,909,375, Cl. 204-64.00R.

Hollies, Norman R. S.: *See*—
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Hollis, Ralph E.: *See*—
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Hollmann, Friedrich Wilhelm: *See*—
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Holstein & Kappert Maschinenfabrik Phonix GmbH: *See*—
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Holtey, Thomas O.; Rajpal, Shashi M.; and Tymann, Edward B., to Honeywell Information Systems Inc. Data processing apparatus incorporating a microprogrammed multifunctioned serial arithmetic unit. 3,909,789, Cl. 340-172.500.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Taguchi, Eiji; Nakano, Soichi; and Iizuka, Yoshitoku, 3,908,619.
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Goss, Gary J.; Kelly, Richard P.; and Miu, Ming T., 3,909,797.
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Recks, John A.; and Pinheiro, Edwin J., 3,909,800.
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Hongo, Masafumi; Handa, Ryoji; and Kamada, Kazumasa, to Mitsubishi Rayon Co., Ltd. Flame-resistant glass-fiber reinforced polytetramethylene terephthalate resin composition. 3,909,485, Cl. 260-40.00R.
Honjo, Satoru: *See*—
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Hook, Bernard K.: *See*—
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Hoover Ball and Bearing Company: *See*—
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Hop, Adrianus G.: *See*—
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Hopkins, Charles L. Electronic water closet controller. 3,908,204, Cl. 4-100.000.
Hopkins Manufacturing Corporation: *See*—
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Horecky, Carl Joseph, Jr.; Fahrig, Robert James; Shields, Robert James, Jr.; and McKinney, Claude Owen, to Standard Oil Company. Fluid catalytic cracking process with substantially complete combustion of carbon monoxide during regeneration of catalyst. 3,909,392, Cl. 208-120.000.
Horiike, Yoshio: *See*—
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Horiuchi, Yoshifumi; and Imamura, Shigeyuki, to Toyo Jozo Company, Ltd. Process for producing insolubilized enzyme. 3,909,360, Cl. 195-68.000.
Horner, George Irwin, to Onway Construction Company, Limited. Counterbalancing system for a drafting table or the like. 3,908,560, Cl. 108-2.000.
Horodysky, Andrew G.; and Raich, Henry, to Mobil Oil Corporation. Extreme pressure grease composition. 3,909,426, Cl. 252-17.000.
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Houser, James L., to United States of America, Commerce. Method and apparatus for fire testing gypsum boards and the like. 3,908,440, Cl. 73-15.600.
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Howmedica, Inc.: *See*—
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Huchital, David A.; and Steinberg, George N., to Perkin-Elmer Corporation. RF Excited electrodeless gas arc lamp for pumping lasers. 3,909,736, Cl. 330-4.300.
Huf, Franz, to Dornier Sustem GmbH. Rotary piston engine of trochoidal construction with a follower gearing traveling in guide rods and forcibly effecting the piston movements. 3,909,163, Cl. 418-61.00B.
Huffman, Bobbie Dale. Low-velocity warning device. 3,909,780, Cl. 340-62.000.
Hughes Aircraft Company: *See*—
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Hughes, Carroll Duane; Painter, Walter Charles; and Rypinski, Chandos Arthur, to RCA Corporation. Data signaling noise suppression system. 3,909,727, Cl. 325-478.000.
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Hurwitz, Mathew. Self-levelling accessory for ladders. 3,908,796, Cl. 182-201.000.
Hussey, Russell B., to AMBAC Industries, Inc. Hydraulically loaded injector nozzle. 3,908,621, Cl. 123-139.00R.
Huttner, Theo, to Bunker Ramo Corporation, The. Apparatus for producing a glass-encapsulated reed contact switch. 3,909,210, Cl. 29-203.00R.
HWM Hermann Weg Maschinenfabrik K.G.: *See*—
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Ichiyama, Tadashi; Sato, Takashi; and Kikuchi, Tsuyoshi, to Nippon Steel Corporation. Process for producing a high magnetic flux density grain-oriented electrical steel sheet. 3,908,432, Cl. 72-365.000.
ICI Australia Limited: *See*—
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Ikeda, Takashi. Apparatus for supplying sheets to a sheet processing machine in successive stacks. 3,908,836, Cl. 214-8.50F.
Ikegaya, Masashi; Suzuki, Matsuo; and Aoshima, Yasuo, to Riken Light Metal Industry Company Limited. Process for producing a protective film on an aluminum surface. 3,909,371, Cl. 204-38.00A.
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Imagawa, Fumio: *See*—
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Inoue, Eiichi; and Shimizu, Isamu, to Canon Kabushiki Kaisha. Recording member of photocolor developing and eliminating material and the recording method. 3,909,266, Cl. 96-45.200.
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Instruments for Industry: *See—*
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Interface Mechanisms, Inc.: *See—*
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Jacobson, Sava. Control circuit for telephone answering device with end of tape detection means. 3,909,538, Cl. 179-6.00R.
Jacobson, Sava W. Magnetic kinetic amusement devices. 3,908,307, Cl. 46-238.000.
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Jones, Robert N., to Xerox Corporation. Xerographic imaging member having photoconductive material in interlocking continuous paths. 3,909,261, Cl. 96-1.500.
Jones, Samuel H.; and McNeany, James M., to LaSalle Steel Company. Steels and method for production of same. 3,908,431, Cl. 72-364.000.
Jones, W. Dale. Inertia switch having movable liquid contact medium retained in reciprocating actuator and engaging helical fixed contact array. 3,909,569, Cl. 200-61.530.
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Kaalverink, Gerardus Hendrikus, to Ruti-Te Strake B.V. Device for the delivery of predetermined weft lengths in a shuttleless weaving machine. 3,908,707, Cl. 139-122.00H.
Kaatz, Robert H. Anchoring device for a flexible sprinkler hose. 3,908,909, Cl. 239-276.000.
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Katz, Murray, to United Technologies Corporation. High performance carbon dioxide scrubber. 3,909,206, Cl. 23-284.000.
Kaunzinger, Helmuth M., to United States of America, Army. Low pass microwave filter. 3,909,755, Cl. 333-73.00C.
Kawada, Toshio; Torama, Tadashi; and Kobayashi, Tamio, to Matsushita Electric Industrial Co., Ltd. Magnetic recording and reproducing apparatus with an automatic cartridge remover. 3,909,844, Cl. 360-61.000.
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Keith, Glen R.; and Thompson, Ronald B., to Morton Metalcraft Co. Mounting means for television sets and the like. 3,908,942, Cl. 248-158.000.
Keizer, Alan S., to Gould Inc. Method for minimizing oxidation in positive displacement casting. 3,908,741, Cl. 164-80.000.
Keizer, Alan S.: *See*—
Schenk, Raymond L., Jr.; and Keizer, Alan S., 3,908,740.
Schenk, Raymond L., Jr.; Cushman, Robert Holbrook; and Keizer, Alan S., 3,908,742.
Keleshian, John V., to Aetna Bearing Company. Thrust bearing assembly. 3,909,086, Cl. 308-233.000.
Keller, Albert G.: *See*—
Morrison, Howard J.; Keller, Albert G.; and Nix, Donald F., 3,909,566.
Kelly, Cornelius James Noel; Morrow, William Clinton; and Zappalorti, Alvaro, to E-B Industries, Inc. Fuse and its method of manufacture. 3,908,509, Cl. 86-1.00R.
Kelly, Richard P.: *See*—
Goss, Gary J.; Kelly, Richard P.; and Miu, Ming T., 3,909,797.
Kendall Company, The: *See*—
Binard, William J., 3,908,656.
Kennedy, Carl D.: *See*—
McGuire, Stephen E.; Riddle, John L.; Nicks, Gene E.; Kerfoot, Oliver Carl; and Kennedy, Carl D., 3,909,432.
Kennedy, Francis M.; and Phillips, David, to Simplimatic Engineering Co. Packer grid and fingers assembly. 3,908,339, Cl. 53-248.000.
Kennedy, John H.: *See*—
Zeitner, Edward J., Jr.; and Kennedy, John H., 3,909,297.
Kenngott, Hans, to Kenngott KG. Flight of steps and a staircase comprising a flight of steps. 3,908,325, Cl. 52-188.000.
Kenngott KG: *See*—
Kenngott, Hans, 3,908,325.
Kerfoot, Oliver Carl: *See*—
McGuire, Stephen E.; Riddle, John L.; Nicks, Gene E.; Kerfoot, Oliver Carl; and Kennedy, Carl D., 3,909,432.
Kerman, Stephen E.; Shinoi, Tsuyoshi; and Kataoka, Tsutomu, to Nippon Tsu Shin Kogyo K.K.; and TIE/Communications, Inc. Conference call circuit for use in a key telephone system. 3,909,552, Cl. 179-99.000.

Kerner, Walter; Mahler, Friedrich; and Peters, Heinrich, to Davy Powergas GmbH. Ultrasonic atomizer for waste sulfuric acid and use thereof in acid cracking furnaces. 3,908,904, Cl. 239-4.000.

Kessler, Berton J., to Cosmeti-Loc Corporation. Method of securing hair pieces. 3,908,674, Cl. 132-53.000.

Ketterer, Stanley J., to Singer Company, The. Apparatus for blind stitch sewing. 3,908,569, Cl. 112-197.000.

Kettering, Donald E., to Vital Assists, Inc. Blood chamber. 3,908,653, Cl. 128-214.00R.

Keuffel & Esser Company: *See*—
Kooi, J. Peter E., 3,908,276.
Levinos, Steven, 3,909,255.
Levinos, Steven, 3,909,273.

Kewanee Oil Co.: *See*—
Skimin, Carol W., 3,909,374.

Keyes, Esse Harold: *See*—
Cunningham, Donald C.; Keyes, Esse Harold; and Cox, Tom W., 3,908,992.

Kidd, Dennis E.; and Ippolito, Anthony C., to Wurlitzer Company, The. Electronic organ with chord control. 3,908,502, Cl. 84-1.010.

Kidd, Wayne L.; and Majewicz, Edward J., to Xerox Corporation. Light source measuring apparatus. 3,909,609, Cl. 250-226.000.

Kiddie Products, Inc.: *See*—
Panicci, Richard L., 3,908,238.

Kidwell, Walter H.; and Kidwell, Walter Scott. Igniter mechanism. 3,909,186, Cl. 431-254.000.

Kidwell, Walter Scott: *See*—
Kidwell, Walter H.; and Kidwell, Walter Scott, 3,909,186.

Kiernan, Thomas H. Portable console. 3,909,092, Cl. 312-235.00A.

Kikkawa, Nobuyuki: *See*—
Tanaka, Kenjiro; Shigeta, Tadao; Kikkawa, Nobuyuki; Kumura, Noriharu; and Ono, Katsuhiro, 3,909,468.

Kikuchi, Tsuyoshi: *See*—
Ichiyama, Tadashi; Sato, Takashi; and Kikuchi, Tsuyoshi, 3,908,432.

Killian, Robert J.; and Sproul, Nolte V., to Aspro, Inc. Apparatus for making multi-groove pulleys. 3,908,421, Cl. 72-82.000.

Kimberly-Clark Corporation: *See*—
Aldinger, Karl E., 3,909,397.

King, John O., Jr. Tubing break-off tool. 3,908,879, Cl. 225-103.000.

King-Seeley Thermos Co.: *See*—
Dickson, George; and Westergaard, Robert K., 3,908,390.

Kingsbury, George R.: *See*—
Kruper, Wayne A.; and Kingsbury, George R., 3,909,209.

Kinnan, Mike: *See*—
Petersen, Harry Arthur; Kinnan, Mike; and Evans, Frederick Drew, Jr., 3,908,306.

Kinneging, Johannes Wilhelmus: *See*—
Berg, Leo; Lenemann, Erhard Johann; and Kinneging, Johannes Wilhelmus, 3,908,719.

Kinoshita, Shouzo; and Ishikawa, Shinichi, to Pioneer Electronic Corporation. Vibration dampening mounting system for wire suspended loudspeaker bobbin. 3,909,557, Cl. 179-115.5VC.

Kinsner, Witold; and Torre, Edward Della, to Canadian Patents and Development Limited. Magnetic bubble domain sensing device. 3,909,809, Cl. 340-174.0TF.

Kinzel, Walter; and Linck, Klaus, to Klockner-Humboldt-Deutz Aktiengesellschaft. Bridge parts, especially floating bodies of an amphibious bridge vehicle. 3,908,580, Cl. 115-1.00B.

Kisanuki, Toru, to Minolta Camera Kabushiki Kaisha. Digital indication exposuremeter. 3,909,137, Cl. 356-223.000.

Kishi, Takao: *See*—
Nozawa, Takamitsu; and Kishi, Takao, 3,908,870.

Kishi, Yasuo; Yokoo, Toshiaki; Imai, Terutoyo; Kanatani, Keiichi; and Yazaki, Takehito, to Director of Agency of Industrial Science & Technology. Dichroic reversible photosensitive materials. 3,909,270, Cl. 96-88.000.

Kishima, Yukihiro, to Victor Company of Japan, Limited. Direct-driven type phonograph turntable. 3,909,643, Cl. 310-68.000.

Kishimoto, Shinzo: *See*—
Miyano, Shizuo; Kishimoto, Shinzo; Yazawa, Kenichiro; and Kondo, Asaji, 3,909,265.

Kitagawa, Norishisa, to Texas Instruments Incorporated. Pre-charge voltage generating system. 3,909,631, Cl. 307-238.000.

Kitamura, Masahiro: *See*—
Ogata, Masatzugu; Tada, Ritsuro; Wajima, Motoyo; Kitamura, Masahiro; Suzuki, Hiroshi; Sato, Mikio; and Kubo, Etuzi, 3,909,480.

Kitamura, Nobuo: *See*—
Ohkoshi, Akio; Shiota, Takizo; and Kitamura, Nobuo, 3,909,524.

Kitamura, Tetsuo, to Ricoh Co., Ltd. Information retrieval system serially comparing search question key words in recirculating registers with data items. 3,909,796, Cl. 340-172.500.

Kitasato Institute, The: *See*—
Hata, Toju; Omura, Satoshi; Katagiri, Michiko; Awaya, Juichi; Kuyama, Shimpei; Higashikawa, Shizuo; Yasui, Kazuomi; and Terada, Haruko, 3,909,361.

Kizu, Taisuke: *See*—
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 3,908,400.

Klatt, Alfred, to WABCO Westinghouse G.m.b.H. Vehicle antiskid brake control system. 3,909,071, Cl. 303-21.0BE.

Klein, Schanzlin and Becker Aktiengesellschaft: *See*—
Wieser, Fritz, 3,909,644.

Kleine, Richard A.; Byers, Warren J.; and Wright, Charles A., to Unarco Industries, Inc. Safety clamp. 3,908,791, Cl. 182-8.000.

Klemm, Gunter, to Fa. Ingenieur Gunter Klemm Spezialunternehmen fur Bohrtechnik. Percussion tool. 3,908,767, Cl. 173-78.000.

Kliklok Corporation: *See*—
Baker, Thomas R., 3,908,890.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Kinzel, Walter; and Linck, Klaus, 3,908,580.

Klosse, Jan Arie; and Klosse, Klaas. Mixing fluid components. 3,908,702, Cl. 138-42.000.

Klosse, Klaas: *See*—
Klosse, Jan Arie; and Klosse, Klaas, 3,908,702.

Klushantsev, Boris Vasilievich; and Speransky, Genrikh Alexandrovich. Gyratory crusher. 3,908,916, Cl. 241-213.000.

Knabe, Uwe: *See*—
Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, 3,908,717.

Kniesly, Richard A.; Colville, Larry L.; and Mullen, Jerrold L., to Ko An, Inc. Control for activating motor vehicle electrical load. 3,909,619, Cl. 307-10.0LS.

Knight, Stanley P.: *See*—
Dobrovolny, Pierre; and Knight, Stanley P., 3,909,726.

Knock-N-Lok International, Inc.: *See*—
Solo, Alan J., 3,908,507.

Knowlton, Keith L. An optical fiber variable display system utilizing a single light source. 3,909,823, Cl. 340-336.000.

Knutson, Harry: *See*—
Dench, John E.; Knutson, Harry; and Seven, Manfred K., 3,909,280.

Knutz, Otto: *See*—
Rietz, Wolfdietrich; Knutz, Otto; and Neubert, Erhard, 3,909,712.

Ko An, Inc.: *See*—
Kniesly, Richard A.; Colville, Larry L.; and Mullen, Jerrold L., 3,909,619.

Kobayashi, Koji: *See*—
Matsui, Yutaka; Kazama, Seiji; Nakabayashi, Masamitsu; and Kobayashi, Koji, 3,909,466.

Kobayashi, Shinkichi: *See*—
Kawai, Masanori; Takada, Haruo; and Kobayashi, Shinkichi, 3,909,639.

Kobayashi, Tadashi: *See*—
Miyashita, Isuneo; Ozeki, Shoichiro; Nishio, Hiroaki; Nayuki, Tosio; Kobayashi, Tadashi; Suzuki, Gyoichi; and Murakami, Tadashi, 3,909,446.

Kobayashi, Tamio: *See*—
Kawada, Toshio; Torama, Tadashi; and Kobayashi, Tamio, 3,909,844.

Kobey, James M.: *See*—
Mammino, Joseph; Jossel, Franklin; Kobey, James M.; Serio, John P.; Solodar, Warren E.; and Walker, Alan H., 3,909,259.

Koch, Peter, to United States of America, Agriculture. Method for producing parallel laminated pine lumber from veneer. 3,908,725, Cl. 144-317.000.

Koch, Terry David, to Inno-Cept Corporation. Side fender. 3,909,053, Cl. 293-62.000.

Kocsis, Joseph: *See*—
Gauge, Thomas P.; Kocsis, Joseph; and Buchanan, James R., 3,909,320.

Koehring GmbH - BOMAG Division: *See*—
Vural, Gulertan; and Linz, Albert, 3,909,148.

Koga, Isao; Fukui, Masahiro; Okamoto, Takehiko; Shimada, Masaru; and Nakamura, Taizo, to Chisso Corporation. Reaction product of naphthenic acids useful as insulating oil. 3,909,435, Cl. 252-64.000.

Koge, Hironori: *See*—
Mukai, Seiki; and Koge, Hironori, 3,908,611.

Kohashi, Tadao, to Matsushita Electric Industrial Co., Ltd. Light modulating device. 3,909,116, Cl. 350-267.000.

Koike, Susumu: *See*—
Fujiwara, Shohei; and Koike, Susumu, 3,909,319.

Kokubo, Yasushi, to Nihon Denshi Kabushiki Kaisha. Apparatus for displaying the energy distribution of a charged particle beam. 3,909,610, Cl. 250-305.000.

Kolic, Edwin S.; and Bereday, Sigmund, to Bereday, Sigmund. Apparatus for producing polymer-coated aluminum products. 3,909,387, Cl. 204-206.000.

Komline-Sanderson Engineering Corporation: *See*—
Day, James T.; Crosby, Robert J.; and Wills, Walter R., 3,909,380.

Kondo, Asaji: *See*—
Miyano, Shizuo; Kishimoto, Shinzo; Yazawa, Kenichiro; and Kondo, Asaji, 3,909,265.

Kono, Yoshimi: *See*—
Gotoda, Masao; Yokoyama, Kenji; Kono, Yoshimi; Toyonishi, Shigekazu; Hiwano, Kunio; and Shimoyama, Takaitsu, 3,909,379.

Kooi, Else: *See*—
Le Can, Claude Jan Principe Frederic; Kooi, Else; and Steinmaier, Walter, 3,909,318.

Kooi, J. Peter E., to Keuffel & Esser Company. Drafting machine braking system. 3,908,276, Cl. 33-76.00R.

Kool, Bram: *See*—
Haning, James O.; Kool, Bram; Moritz, Jules G.; and Mizrahi, Robert, 3,909,122.

Kooyman, Henk H.: *See*—
Videm, Ketil G.; Lunde, Liv R.; and Kooyman, Henk H., 3,909,370.

Koppel, Richard M. Device for retrieving small sheets such as radiographs from a tank. 3,909,055, Cl. 294-64.00R.

Kores Holding Zug AG: *See*—
Gely, Michel Albert, 3,908,819.
Korner, Renzo L.: *See*—
Bereza, Albert; Korner, Renzo L.; and Franke, Milton W., 3,909,500.
Kosisky, Daniel F. Holder and server for beverage cups and the like. 3,908,877, Cl. 224-48.00A.
Koskolos, Nick J.; and Lefarth, Ralph R., to Intertherm, Inc. Adjustable depth router. 3,908,510, Cl. 90-12.00D.
Kosuge, Takashi; and Sano, Ichiro, to Furukawa Denchi Kabushiki Kaisha. Vibration-proof battery. 3,909,294, Cl. 136-81.000.
Kotera, Masao: *See*—
Wakamatsu, Hisato; Hinachi, Matatoyo; and Kotera, Masao, 3,909,670.
Kotz, Arthur R., to Minnesota Mining and Manufacturing Company. Electrographic development process. 3,909,258, Cl. 96-1.00R.
Kouklik, Ivo: *See*—
Maler, Josef; Lorenc, Jaroslav; and Kouklik, Ivo, 3,908,406.
Kowarski, Avinoam, to Johns Hopkins University, The. System for continuous withdrawal of blood. 3,908,657, Cl. 128-278.000.
Kraftco Corporation: *See*—
Renck, Lawrence E., 3,909,326.
Krakow, Heinz, to Blohm and Voss AG. Method for welding aligned sheet metal plates together for forming a band for making spiral seam tubes. 3,909,580, Cl. 219-105.000.
Kramer, Friedhelm; and Brunk, Klaus, to General Motors Corporation. Energy-absorbing vehicle body end structure. 3,909,058, Cl. 296-28.00R.
Kramer, Steven G. Surgical instruments. 3,908,661, Cl. 128-305.000.
Kraus, Heinz, to Dr. Johannes Heidenhain GmbH, Firma. Inductive transmitter of readings. 3,909,760, Cl. 336-84.000.
Krauss-Maffei Aktiengesellschaft: *See*—
Bielfeldt, Friedrich Bernd; and Schaa, Wolfgang, 3,908,968.
Kray, Louis R., to Chevron Research Company. Rust inhibitors for hydrocarbon fuels. 3,909,215, Cl. 44-62.000.
Kraychy, Stephen: *See*—
Jiu, James; Kraychy, Stephen; and Mizuba, Seth S., 3,909,362.
Krcmar, Frank: *See*—
Townsend, Herbert E., Jr.; and Krcmar, Frank, 3,909,048.
Kreis AG: *See*—
Muller, Paul Curt; Kehl, Niklaus; and Kreis, Egon, 3,909,574.
Kreis, Egon: *See*—
Muller, Paul Curt; Kehl, Niklaus; and Kreis, Egon, 3,909,574.
Kreissl, Ottmar; and Pritsch, Eckhard, to Maschinenfabrik Augsburg-Nurnberg AG; and URANIT Uran-Isotopentrennungs-GmbH. Installation for stopping drive motor of rotating machine in event of destruction of a rotating machine part. 3,909,673, Cl. 317-13.00R.
Krenzer, John, to Velsicol Chemical Corporation. Method for the control of aquatic plant life. 3,909,230, Cl. 71-66.000.
Krezanoski, Joseph Z., to Flow Pharmaceuticals, Inc. Methods for cleaning and bleaching plastic articles. 3,908,680, Cl. 134-27.000.
Krimmel, Eberhard: *See*—
Boroffka, Hartmut; Krimmel, Eberhard; and Runge, Hartmut, 3,909,305.
Krisch, Lothar: *See*—
Martin, Helmut; and Krisch, Lothar, 3,909,560.
Krol, Thijs; and Verhoeckx, Nicolaas Alphonsus Maria, to U.S. Philips Corporation. Method of code conversion of messages. 3,909,781, Cl. 340-347.0DD.
Kronlage, John William, to Texas Instruments Incorporated. High-speed transistor with rectifying contact connected between base and collector. 3,909,837, Cl. 357-15.000.
Krueger, Ralph G.: *See*—
Grundy, Gary L.; Steiner, David C.; Gutzmann, Gerard C.; and Krueger, Ralph G., 3,909,739.
Krumpelt, Michael: *See*—
Mueller, Andrew G.; Krumpelt, Michael; Pitteroff, Walter A.; Argade, Shyam D.; and Louvar, Joseph F., 3,909,382.
Kruper, Wayne A.; and Kingsbury, George R., to Gould Inc. Method of treating aluminum and aluminum alloys and article produced thereby. 3,909,209, Cl. 29-183.500.
Kubierschky, Klaus: *See*—
Jagoda, Neil H.; Kubierschky, Klaus; and Baker, Howard S., 3,909,821.
Kubo, Etuzi: *See*—
Ogata, Masatzugu; Tada, Ritsuro; Wajima, Motoyo; Kitamura, Masahiro; Suzuki, Hiroshi; Sato, Mikio; and Kubo, Etuzi, 3,909,480.
Kubo, Morihiro: *See*—
Omori, Yoshitaka; and Kubo, Morihiro, 3,909,512.
Kuchenmeister, Rolf: *See*—
Freitag, Dieter; Rudolph, Hans; Niehaus, Clemens; and Kuchenmeister, Rolf, 3,909,495.
Kuhlman Corporation: *See*—
Fisher, John L., 3,909,509.
Wilks, Alan L.; Richerson, James D.; and Cormany, M. Denton, 3,909,762.
Kuismi, Gust M. Trolling rig. 3,908,300, Cl. 43-43.130.
Kumagai, Ikuo: *See*—
Shimodaira, Toyohisa; Sato, Akio; and Kumagai, Ikuo, 3,908,802.
Kumar, Vasant R., to Curtiss-Wright Corporation. Counterweighted apex seal for rotary engines. 3,909,013, Cl. 277-25.000.
Kumar, Vijay R.: *See*—
Bankowski, Walter F., Jr.; Kumar, Vijay R.; McGovern, William; and Tartamella, John D., 3,909,803.
Kumura, Noriharu: *See*—
Tanaka, Kenjiro; Shigeta, Tadao; Kikkawa, Nobuyuki; Kumura, Noriharu; and Ono, Katsuhiro, 3,909,468.
Kumura, Shoji; Ohno, Masayoshi; and Ohya, Haruhiko, to Tokyo Shibaura Electric Co., Ltd. Gas separating apparatus. 3,909,218, Cl. 55-158.000.
Kupiek, Heinrich: *See*—
Otto, Alfred; Feldhoff, Hermann Josef; Kupiek, Heinrich; and Brackelmann, Gerd, 3,908,803.
Kuraray Co. Ltd.: *See*—
Okamura, Takayuki; Minatono, Shobu; Yamauchi, Junnosuke; and Yamauchi, Kazuhisa, 3,909,473.
Kureha Kagaku Kogyo K.K.: *See*—
Nagai, Hirosi; Katori, Kunihiko; Shiiki, Zenya; and Amagi, Yasuo, 3,909,449.
Kurita, Kunio: *See*—
Ishida, Shinichi; Oshima, Noboru; Kurita, Kunio; Suzuki, Isamu; and Ohno, Hidetoshi, 3,909,408.
Kuriyama, Ichizo; and Mori, Yasunobu, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Wear-resistant cast iron for sliding surfaces. 3,909,252, Cl. 75-128.00B.
Kuroda, Osamu, to Toyota Jidosha Kogyo Kabushiki Kaisha. System for cleaning exhaust gases from an internal combustion engine. 3,908,370, Cl. 60-290.000.
Kuttner, Ralph, to Stoody Company. Control system for continuous-casting drive unit. 3,908,747, Cl. 164-154.000.
Kuyama, Shimpei: *See*—
Hata, Toju; Omura, Satoshi; Katagiri, Michiko; Awaya, Juichi; Kuyama, Shimpei; Higashikawa, Shizuo; Yasui, Kazuomi; and Terada, Haruko, 3,909,361.
Kuzhelev, Valentin Ivanovich: *See*—
Glaskov, Ilya Mikhailovich; Zaitsev, Valentin Andreevich; Kuzhelev, Valentin Ivanovich; Raikhman, Yakov Aronovich; and Svidelsky, Arnold Petrovich, 3,909,130.
Kuznetsov, Evgeny Petrovich: *See*—
Asnis, Avraam Efimovich; Gretsky, Jury Yakovlevich; Kuznetsov, Evgeny Petrovich; Slavinsky, Nikolai Alexandrovich; and Melnichenko, Igor Mikhailovich, 3,909,253.
KVB Engineering, Inc.: *See*—
Diaz, Arthur F.; and Guth, Eugene D., 3,909,211.
Kwan, Fred K. C., to Standard Oil Company. Preparation of 2,5-dibromoterephthalate unsaturated polyester. 3,909,496, Cl. 260-75.00H.
Kyowa Hakko Kogyo Co., Ltd.: *See*—
Suzuki, Takeo; and Ito, Seiga, 3,909,356.
Kysely, Zdenek, to Robert Bosch G.m.b.H. Capacitor with overheating protection. 3,909,683, Cl. 317-247.000.
L & R Industries: *See*—
Hammond, William D., 3,908,626.
La Cellophane: *See*—
Riboulet, Robert; and Galery, Yves, 3,909,170.
Laakmann, Peter; and Boutin, Charles U., to Hughes Aircraft Company. Variable duty cycle arc lamp modulator. 3,909,668, Cl. 315-209.000.
Lacan, Guy H., to Technilec. Column for electrical supply cables. 3,909,502, Cl. 174-48.000.
Lacotte, Jean Pierre: *See*—
Le Merer, Jean Pierre; Le Carvennec, Francois; Lacotte, Jean Pierre; Malissin, Roland; Puech, Claude; and Tinet, Claude, 3,909,608.
Lafarge (Societe Anonyme): *See*—
Fripiat, Jose, Marie, Maurice, Julien, 3,909,285.
Lager, Jean Paul, to International Standard Electric Corporation. Switching network testing process and arrangement. 3,909,562, Cl. 179-175.20R.
LaGrange, Donald E.: *See*—
Beatty, Bobby D.; Herold, Stanley J.; LaGrange, Donald E.; and Sanders, David K., 3,908,550.
Laing, Nikolaus. Rotating heat exchanger. 3,908,754, Cl. 165-86.000.
Laitram Corporation, The: *See*—
Lapeyre, James M., 3,908,217.
Lajovic, Dusan S., to Colgate-Palmolive Company. Apparatus for protectively covering container necks. 3,909,182, Cl. 425-510.000.
Lambert, Charles F., Jr., to Clayton & Lambert Manufacturing Company. Depending-auger and surrounding-sleeve silage hole-former. 3,908,840, Cl. 214-17.0DB.
Lambert, Gray; and Hanselman, Paul N., to United Business and Professional Services, Inc. Record keeping tray and assembly. 3,908,821, Cl. 206-73.000.
Lambuth, Alan L.; and Hearon, William Montgomery, to Boise Cascade Corporation. Thermosetting adhesive compositions extended with cellulosic paper mill sludges. 3,909,470, Cl. 260-17.300.
Lamm, Heinz, to Daimler-Benz Aktiengesellschaft. Rotary piston internal combustion engine. 3,908,612, Cl. 123-8.130.
Landesanstalt fur Immissions und Bodennutzungsschutz des Landes Nordrhein-Westfalen: *See*—
Hartkamp, Heinrich; and Nitz, Gerhard, 3,908,696.
Landis, George Gideon; Nosse, Joseph Rudolph; and Baker, Ivan Edward, to Lincoln Electric Company, The. Method and means for removing smoke from open arc welding operations. 3,909,586, Cl. 219-130.000.
Landis Tool Company: *See*—
Price, Ralph E.; and Bricker, Robert E., 3,908,627.
Landreth, Thomas C.: *See*—
Sanders, Harold D.; and Landreth, Thomas C., 3,909,585.

Landrum, Ralph A., Jr.: *See—*
Broding, Robert A.; and Landrum, Ralph A., Jr., 3,909,776.

Lang Davis Industries, Inc.: *See—*
Lang, Thomas J.; Lang, Joseph A.; Lang, Kenneth G.; and Davis, Robert L., 3,908,782.

Lang, John L. Clarifying agents for water. 3,909,406, Cl. 210-47.000.

Lang, Joseph A.: *See—*
Lang, Thomas J.; Lang, Joseph A.; Lang, Kenneth G.; and Davis, Robert L., 3,908,782.

Lang, Kenneth G.: *See—*
Lang, Thomas J.; Lang, Joseph A.; Lang, Kenneth G.; and Davis, Robert L., 3,908,782.

Lang, Thomas J.; Lang, Joseph A.; Lang, Kenneth G.; and Davis, Robert L., to Lang Davis Industries, Inc. Automatic stability control system. 3,908,782, Cl. 180-103.000.

Lange, Kenneth Wilson; and Maher, James Bernard, to Chicago Bridge & Iron Company. Recovery system for oxygen from waste water oxygenation. 3,909,409, Cl. 210-60.000.

Langenstein & Schemann Aktiengesellschaft: *See—*
Bachmann, Horst, 3,908,437.

Lapeyre, James M., to Laitram Corporation, The. Submergible bridge. 3,908,217, Cl. 14-42.000.

Large, George B., to Stauffer Chemical Company. Cyano substituted malanilate biocides. 3,909,231, Cl. 71-67.000.

Larkin, William A.; and Ringwood, Robert C., Jr., to M & T Chemicals Inc. Stabilization of vinyl chloride polymers with mixtures of organotin mercaptides and mercaptoesters. 3,909,492, Cl. 260-45.75S.

Larson, Charles O., to Chas. O. Larson Co. Article support bracket. 3,908,949, Cl. 248-223.000.

Larson, Willis A.: *See—*
Colglazier, David E.; and Larson, Willis A., 3,909,625.

LaSalle Steel Company: *See—*
Jones, Samuel H.; and McNeany, James M., 3,908,431.

Latter, Geoffrey, to A. C. Hamilton & Co. Injection moulding machine. 3,909,173, Cl. 425-192.000.

Lau, Gunther; Bradatsch, Edmund; and Brandl, Hermann J. Apparatus for impregnating corrugated cardboard. 3,908,587, Cl. 118-50.000.

Laubscher, Karl F.: *See—*
Recks, John A.; Cassarino, Frank V., Jr.; Getson, Edward F., Jr.; Laubscher, Karl F.; McLaughlin, Albert T.; and Pinheiro, Edwin J., 3,909,799.

Laumont, Roger, to Hydroperfect-International H P I. Geared hydraulic apparatus. 3,909,165, Cl. 418-102.000.

Laureau, Maurice. Automatic water supplying apparatus for a vehicle equipped with a sprinkler bank. 3,908,692, Cl. 137-355.160.

Laurer, George Joseph; and Moore, Eugene Arnold, to International Business Machines Corporation. Candidate selection processor. 3,909,787, Cl. 340-146.30Z.

Lauterbach, William L., to United States Steel Corporation. Device for alignment of briquette rolls. 3,909,079, Cl. 308-3.900.

Lavigne, Jean C., to Schlumberger Technology Corporation. Methods and apparatus for acoustic logging through casing. 3,909,775, Cl. 340-15.5BH.

Lawrence, Gerald Norman, to General Electric Company Limited, The. Digital telecommunications switching systems. 3,909,786, Cl. 340-147.00C.

Lawrence Peska Associates, Inc.: *See—*
Meidell, Rolf W., 3,908,541.

Lawrence, Peter: *See—*
George, Robert F.; and Lawrence, Peter, 3,908,946.

Lawrence, Simone P.: *See—*
George, Robert F.; and Lawrence, Peter, 3,908,946.

Laws, William Robert: *See—*
English, Paul Everitt; Ashcroft, Ian Reginald; Norris, Paul Alfred; Salter, Frank Michael; Laws, William Robert; and McChesney, Herbert Raymond, 3,908,459.

Lazaridis, Lazaros J.; Nunes, Maurice; and Nydick, Sander E., to Thermo Electron Corporation. Jet impingement recuperator. 3,908,628, Cl. 126-91.00A.

Lazzari, administratrix, Mary L.: *See—*
Lazzari, Gilbert A., deceased; and Lazzari, administratrix, Mary L., 3,909,054.

Lazzari, Gilbert A., deceased; and Lazzari, administratrix, Mary L. Weed puller. 3,909,054, Cl. 294-50.900.

Leblond, Jean R.; and Verhulst, Jacques P., to Uniroyal (France). Apparatus for applying an apex strip to a bead ring. 3,909,338, Cl. 156-422.000.

Le Can, Claude Jan Principe Frederic; Kooi, Else; and Steinmaier, Walter, to U.S. Philips Corporation. Method of forming complementary devices utilizing outdiffusion and selective oxidation. 3,909,318, Cl. 148-175.000.

Le Carvennec, Francois: *See—*
Le Merer, Jean Pierre; Le Carvennec, Francois; Lacotte, Jean Pierre; Malissin, Roland; Puech, Claude; and Tinet, Claude, 3,909,608.

Leco Corporation: *See—*
Leonarduzzi, Felix L., 3,909,077.

Lee, Arthur L.; and Coval, Arthur B., to FMC Corporation. Articulated haulage vehicle. 3,908,841, Cl. 214-83.360.

Lee, Charles D., Jr., to Parks-Cramer Company. Traveling textile machine tending unit. 3,908,346, Cl. 57-34.00R.

Lee, David Q.; and Srivastava, Dinesh K., to GTE Automatic Electric Laboratories Incorporated. Arrangement for controlling a plurality of lamps. 3,909,822, Cl. 340-324.00R.

Lefarth, Ralph R.: *See—*
Koskolos, Nick J.; and Lefarth, Ralph R., 3,908,510.

LeFebvre, Clarence A.; and Schoen, Lewis L., to United Technologies Corporation. Putty propellant stress refief system. 3,908,364, Cl. 60-252.000.

Lefevre, Edouard: *See—*
Porcher, Alain; and Lefevre, Edouard, 3,908,638.

Leger, Roland E. High speed current collection. 3,908,806, Cl. 191-66.000.

Legris, Andre, to Societe Legris France S.A. Connector for fluid conduits, such as semi-rigid pipes. 3,909,046, Cl. 285-39.000.

Leiber, Heinz, to Teldix GmbH. Anti-locking control system. 3,909,070, Cl. 303-21.00P.

Leiblich, Gordon Francis. Electric fence. 3,908,964, Cl. 256-10.000.

Leikarts, Aldis J.: *See—*
Miller, Larry R.; and Leikarts, Aldis J., 3,908,564.

Leko, Toma D. Gaskets. 3,909,019, Cl. 277-209.000.

Lemaire, Guy: *See—*
Bellisai, Giorgio; Lemaire, Guy; and Gerard, Claude, 3,908,883.

Le Merer, Jean Pierre; Le Carvennec, Francois; Lacotte, Jean Pierre; Malissin, Roland; Puech, Claude; and Tinet, Claude, to Thomson-CSF. Reproducing device for the optical reading out of a record carrying an embossed print. 3,909,608, Cl. 250-202.000.

Lenemann, Erhard Johann: *See—*
Berg, Leo; Lenemann, Erhard Johann; and Kinneging, Johannes Wilhelmus, 3,908,719.

Leonard, Gordon C., to Meat Separator Corporation. Bone dropout pan. 3,909,398, Cl. 209-156.000.

Leonard, Verna M. Diatonic and chromatic chord dial. 3,908,506, Cl. 84-471.000.

Leonarduzzi, Felix L., to Leco Corporation. Pivot assembly mounting apparatus. 3,909,077, Cl. 308-2.00R.

Leong, Joseph Wing. Comestible cleaning apparatus. 3,909,291, Cl. 134-115.00G.

Leoni, Ray Dennis, to United Technologies Corporation. Servo jam by-pass linkage. 3,908,513, Cl. 91-384.000.

Leto, Frank, to Western Technical Products Co. Utensil. 3,908,887, Cl. 229-1.50C.

Lever, Ray Clarence; and Wilkus, Edward Vincent, to General Electric Company. Method of halogenating thermoplastic polyolefins. 3,909,486, Cl. 260-42.000.

Levi Strauss & Co.: *See—*
Marchio, Douglas R.; and Mayfield, David N., 3,909,831.

Levine, Sol; and Radice, Michael, to Revlon, Inc. Mascara applicator. 3,908,676, Cl. 132-88.700.

Levinos, Steven, to Keuffel & Esser Company. Electrolytically induced polymerization utilizing zinc and alkali metal sulfite. 3,909,255, Cl. 96-1.00E.

Levinos, Steven, to Keuffel & Esser Company. Photopolymerization utilizing diazosulfonate and aromatic hydroxy compounds. 3,909,273, Cl. 96-115.00P.

Levy, David. Data-processing system for determining gains and losses from bets. 3,909,002, Cl. 273-138.00A.

Lewis, Alfred H.: *See—*
Phares, Earl K.; and Lewis, Alfred H., 3,909,575.

Lewis, Richard C. Dispenser for granular material. 3,908,873, Cl. 222-480.000.

Leybold-Heraeus-Verwaltung G.m.b.H.: *See—*
Thomas, Friedrich Werner; and Vock, Gerhard, 3,909,662.
Thomas, Friedrich Werner; and Vock, Gerhard, 3,909,663.

Lhoest, Willy; and Hoye, Eloi Van, to Recherche et Industrie Therapeutiques. Dispensing package for a dry biological and a liquid diluent. 3,908,654, Cl. 128-218.00M.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Wozniak, Bernhard; and Kaffenberger, Ernst, 3,908,427.

Lichowsky, Abraham, to Ambitex Corporation and Cendev Corporation, Ambitex Company. Pressure transducer. 3,908,460, Cl. 73-398.00R.

Liebergott, Norman; and Bolker, Henry I., to Pulp and Paper Research Institute of Canada. Bleaching of textiles with chlorine monoxide. 3,909,194, Cl. 8-108.000.

Lileev, Valeryan Petrovich: *See—*
Onikov, Eduard Arshakovich; Zabotin, Alexandr Alexandrovich; Lileev, Valeryan Petrovich; Rutkevich, Zinovy Yakovlevich; Sakharov, Boris Alexandrovich; and German, Roman Anatolievich, 3,908,706.

Lim, Chai-Kil. Fan hat apparatus. 3,908,199, Cl. 2-175.000.

Linares, Robert C.: *See—*
Neinart, Louis F.; Linares, Robert C.; Jeges, Paul; and Blank, Zvi, 3,908,644.

Linck, Klaus: *See—*
Kinzel, Walter; and Linck, Klaus, 3,908,580.

Lincoln Electric Company, The: *See—*
Landis, George Gideon; Nosse, Joseph Rudolph; and Baker, Ivan Edward, 3,909,586.

Link, Edwin A., to RTE Corporation. Fused vacuum interrupter. 3,909,765, Cl. 337-159.000.

Linkletter, Robert P. Safety dispensing device. 3,908,958, Cl. 251-95.000.

Linz, Albert: *See—*
Vural, Gulertan; and Linz, Albert, 3,909,148.

Lipkind, Harry I., to United States of America, America. Microscope comparator. 3,909,135, Cl. 356-172.000.

List, Hans: *See—*
Schreiber, Erich, 3,908,450.

Littelfuse, Inc.: *See—*
Williamson, Harold L.; and Aryamane, Avinash P., 3,909,767.

Little, Ward Arthur, to General Electric Company. Method and apparatus for dispensing air-curable viscous materials. 3,908,869, Cl. 222-148.000.

Littlejohn, James H.; and Dworschack, Robert G., to Standard Brands Incorporated. Treatment of cellular material containing glucose isomerase. 3,909,355, Cl. 195-31.00F.

Litton Business Systems, Inc.: *See*—
Miller, Larry R.; and Leikarts, Aldis J., 3,908,564.

Litton Medical Products, Inc.: *See*—
Redfield, Charles L.; Schultz, Robert G.; and Van Art, Arne, 3,909,616.

Litton Systems, Inc.: *See*—
Kaelin, George R.; and Pellegrino, James A., 3,909,788.

Lloyd, Norman E.: *See*—
Thompson, Kenneth N.; Johnson, Richard A.; and Lloyd, Norman E., 3,909,354.

Lobach, James L., to Sperry Rand Corporation. Geothermal energy turbine and well system. 3,908,380, Cl. 60-641.000.

Loby, Gilbert Maurice. Method of feeding an internal combustion engine and improved apparatus for performing the same. 3,908,613, Cl. 123-25.00C.

Lohwasser, Kurt. Container for foodstuff or other material. 3,908,828, Cl. 206-504.000.

Lok-Box, Inc.: *See*—
Retteu, Richard L., 3,908,316.

Loliger, Willi, to Societe d'Assistance Technique pour Produits Nestle S.A. Seal. 3,909,014, Cl. 277-72.00R.

Lomas, Teddie Ward: *See*—
Hobson, John Douglas; and Lomas, Teddie Ward, 3,909,133.

Long, John Albert. Card feeder. 3,908,983, Cl. 271-35.000.

Long, Leslie T., to Hays Enterprises. Ignition system. 3,908,622, Cl. 123-148.00E.

Long, Meletus I.: *See*—
Benninger, Arthur C.; and Long, Meletus I., 3,909,059.

Long, Olan L., to White-Westinghouse Corporation. Dishwasher tub gasket surface. 3,908,854, Cl. 220-74.000.

Loomis, Charles M.; and Loomis, Gerald M. Method of making a truck ladder. 3,908,260, Cl. 29-434.000.

Loomis, Gerald M.: *See*—
Loomis, Charles M.; and Loomis, Gerald M., 3,908,260.

Looney, Catharine Elizabeth: *See*—
Dessauer, Rolf; and Looney, Catharine Elizabeth, 3,909,328.

Lordel Manufacturing Company: *See*—
Reed, John M., 3,909,554.

Lorenc, Jaroslav: *See*—
Maler, Josef; Lorenc, Jaroslav; and Kouklik, Ivo, 3,908,406.

Loseff, Herbert S. Wound suction tube and retrograde flushing. 3,908,664, Cl. 128-350.00R.

Lotan, Dan: *See*—
Ferre, Salvador; Lotan, Dan; Morbioli, Rene Jean; Schmitt, Jean-Claude Alphonse Henri; and Cordazzo, Jean-Louis, 3,909,652.

Lou, Wo Joaa; Volgyi, Paul; and Defossez, Roger, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Clasp for bond. 3,908,243, Cl. 24-230.0AK.

Louie, Albert: *See*—
Bates, H. John; Louie, Albert; and Gee, John F., 3,908,963.

Louison, Claude Joseph. Fishing reel. 3,908,927, Cl. 242-84.21A.

Louvar, Joseph F.: *See*—
Mueller, Andrew G.; Krumpelt, Michael; Pitteroff, Walter A.; Argade, Shyam D.; and Louvar, Joseph F., 3,909,382.

Loyd, Patrick V.; and Mills, Samuel M., to Stone Industrial Corporation. Method of applying an insulating connector. 3,908,267, Cl. 29-631.000.

Lubas, Egon, to HWM Hermann Weg Maschinenfabrik K.G. Apparatus for continuously conveying and/or stacking sheet-like articles, particularly sheet-metal. 3,908,835, Cl. 214-6.0FS.

Lubojatsky, Walter; and Wertelewski, Wilhelm, to Becorit Grubenausbau GmbH. Mine roof support. 3,908,389, Cl. 61-45.00D.

Lubs, Hans Joachim: *See*—
Reinhard, Ernst; Boy, Hans-Martin; Stach, Kurt; Kaiser, Fritz; and Lubs, Hans Joachim, 3,909,357.

Lucas Electrical Company Limited: *See*—
Ironside, John Michael; and Cops, Michael Herbert, 3,908,614.

Luce, David W. Direct connection digital transmission apparatus. 3,909,510, Cl. 178-2.00R.

Lukes, Jerome A., to Erco Envirotech Ltd. Removal of sodium chloride from pulp mill operations. 3,909,344, Cl. 162-19.000.

Lummus Company, The: *See*—
O'Connor, Ward F.; and Crawford, Ernest A., 3,908,471.

Lund, Helen B. Post-operative cooling device. 3,908,655, Cl. 128-256.000.

Lundberg, Kurt Bonnie Karl Axel. Cabinet with at least one withdrawable part. 3,909,093, Cl. 312-319.000.

Lunde, Liv R.: *See*—
Videm, Ketil G.; Lunde, Liv R.; and Kooyman, Henk H., 3,909,370.

Lunden, Sidney L., to Moore-lem, Inc. Guide means for lumber stacking machine. 3,908,834, Cl. 214-6.0DK.

Lundin, Tord Rune, to Gullfiber AB. Ear protecting device. 3,908,200, Cl. 2-209.000.

Lundquist, Thomas G.; and Burtnyk, Victor, to Westinghouse Electric Corporation. Capacitor bank protection relay. 3,909,672, Cl. 317-12.00B.

Lundsted, Lester G.: *See*—
Parker, Edward T.; and Lundsted, Lester G., 3,909,345.

M & T Chemicals Inc.: *See*—
Larkin, William A.; and Ringwood, Robert C., Jr., 3,909,492.

Ma, James W., to Berg Manufacturing Company, The. Adjustment means for double diaphragm spring brake chamber actuator. 3,908,520, Cl. 92-94.000.

MacDuff, Stanley I. Variable ratio rack and pinion power steering gear. 3,908,479, Cl. 74-498.000.

Machell, Greville; and Thomas, Manuel A., to Deering Milliken Research Corporation. Process of modifying textile materials with polymerizable monomers. 3,909,195, Cl. 8-115.700.

Machida, Humimasa: *See*—
Yokota, Hiroshi; and Machida, Humimasa, 3,909,694.

MacKenzie, Donald D.: *See*—
Pannullo, Louis A.; and MacKenzie, Donald D., 3,908,458.

MacKenzie, Robert A. Stretch-draw metal forming. 3,908,428, Cl. 72-296.000.

MADAG Maschinen-und Apparatebau Dietikon AG: *See*—
Zullig, Heinz, 3,908,404.

Madison, Norman L.; Meyer, Victor E.; Beaumont, Gerald P.; and Nelson, Alfred R., to Dow Chemical Company, The. Warp-sizing compositions and yarns sized therewith. 3,909,477, Cl. 260-29.70H.

Madonini, Nino, to Industrie Pirelli S.p.A. Device for the manufacture of bands reinforced with longitudinal wires. 3,909,176, Cl. 425-305.000.

Maeda Industries, Ltd.: *See*—
Ozaki, Nobuo; and Kawai, Sadao, 3,908,807.

Maeder, Arthur: *See*—
Toepfl, Rosemarie; Abel, Heinz; and Maeder, Arthur, 3,909,494.

Maekawa, Takehiko; Nakada, Masahiko; and Matsumoto, Hirofumi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake manifold. 3,908,620, Cl. 123-122.0AB.

Magic Dot, Inc.: *See*—
Colglazier, David E.; and Larson, Willis A., 3,909,625.

Magnani, Luigi: *See*—
Beretta, Paolo; and Magnani, Luigi, 3,909,274.
Gandino, Mario; and Magnani, Luigi, 3,909,275.

Magnavox Company, The: *See*—
Evansen, Arthur W., 3,909,515.

Maher, James Bernard: *See*—
Lange, Kenneth Wilson; and Maher, James Bernard, 3,909,409.

Mahler, Friedrich: *See*—
Kerner, Walter; Mahler, Friedrich; and Peters, Heinrich, 3,908,904.

Maida, Osamu, to Nippon Kogaku K.K. Cycling timer apparatus with automatic interruption and hold. 3,909,635, Cl. 307-293.000.

Main, John A., to Motor Wheel Corporation. Vehicle wheel. 3,909,065, Cl. 301-63.0DD.

Majeau, Henrie L.; Barnes, Roland O.; Hove, Robert G.; and Angell, Abraham L., Jr., to Boeing Company, The. Voice privacy unit for intercommunication systems. 3,909,534, Cl. 179-1.50R.

Majewicz, Edward J.: *See*—
Kidd, Wayne L.; and Majewicz, Edward J., 3,909,609.

Makara, Satoshi: *See*—
Inaba, Masao; Kashigi, Kazuo; Makara, Satoshi; and Nakamura, Harunobu, 3,909,839.

Maler, Josef; Lorenc, Jaroslav; and Kouklik, Ivo, to Elitex, Zavody textilniho strojirenstvi generalni veditelstvi. Apparatus for controlling the programming chain of a circular knitting machine. 3,908,406, Cl. 66-155.000.

Maley, Gerald A.; and Walsh, James L., to International Business Machines Corporation. Three state latch. 3,909,634, Cl. 307-289.000.

Malissin, Roland: *See*—
Le Merer, Jean Pierre; Le Carvennec, Francois; Lacotte, Jean Pierre; Malissin, Roland; Puech, Claude; and Tinet, Claude, 3,909,608.

Mallinckrodt, Inc.: *See*—
Fischer, Julius F.; and Scully, Daniel F., 3,909,472.

Malo, Lowell L., to ACF Industries, Incorporated. Bulkhead trolley and locking device. 3,908,558, Cl. 105-376.000.

Mammino, Joseph; Jossel, Franklin; Kobey, James M.; Serio, John P.; Solodar, Warren E.; and Walker, Alan H., to Xerox Corporation. Color electrophotographic imaging process utilizing specific carrier-toner combinations. 3,909,259, Cl. 96-1.200.

Man, Pang L.; Chen, Calvin H.; and Donofrio, William T., to American Acupuncture Medical Instruments, Inc. Apparatus for use by physicians in acupuncture research. 3,908,669, Cl. 128-422.000.

Mandell, Harry Creston, Jr., to Pennwalt Corporation. Temporary soil release resins applied to fabrics in laundering. 3,909,476, Cl. 260-29.60H.

Maneely-Illinois, Inc.: *See*—
Rossi, Joseph R.; Griffiths, Frederick J.; Griffin, James L.; and Palleson, Gormen C., 3,908,593.

Manjiklan, Serop, to United States of America, Interior. Bonding composition. 3,909,279, Cl. 106-180.000.

Mannesmann Aktiengesellschaft: *See*—
Findeisen, Gerhard; Dautzenberg, Norbert; and Gesell, Hartmut, 3,909,239.

Manson, Peter St. Clair; and Hooten, Basil P., to Motorola, Inc. FM/AM radio receiver tuning apparatus. 3,909,723, Cl. 325-315.000.

Mapes, Stuart N.: *See*—
Wisner, George R.; Mapes, Stuart N.; and Skolnick, Michael L., 3,909,744.

Marchio, Douglas R.; and Mayfield, David N., to Levi Strauss & Co. Fluid applicating device. 3,909,831, Cl. 346-140.000.

Marcuse, Dietrich, to Bell Telephone Laboratories, Incorporated. Reduction of dispersion in a multimode fiber waveguide with core index fluctuations. 3,909,110, Cl. 350-96.0WG.

Margala, Jean Pierre; and Cassany, Jean Louis Roger, to International Standard Electric Corporation. Frequency synthesizer with pseudo-reference phase comparator. 3,909,743, Cl. 331-11.000.

Maria, Paul N.; and Conard, Albert C. Driver training and gasoline saving device. 3,909,778, Cl. 340-52.00R.

Marino, Peter T., to International Business Machines Corporation. H-Configured integration circuits with particular squelch circuit. 3,909,629, Cl. 307-229.000.

Marino, Peter T.: *See*—
Fiorino, Benjamin C.; and Marino, Peter T., 3,909,630.

Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 3,909,490, Cl. 260-45.70S.

Marlboro Manufacturing Inc.: *See*—
Cain, James F., 3,908,227.

Marler Haley Expo Systems Limited: *See*—
Bannister, Brian Charles, 3,908,943.

Marrara, Charles G.: *See*—
George, Harvey F.; Oppenheimer, Robert H.; Marrara, Charles G.; and Cairns, David W., 3,909,138.

Marsan, Arthur E. Seal and appliance for ostomy patients. 3,908,658, Cl. 128-283.000.

Marshall, John. Display stand. 3,908,832, Cl. 211-133.000.

Marshall, Richard A., to GTE Automatic Electric Laboratories Incorporated. Dial selective intercommunication system. 3,909,551, Cl. 179-99.000.

Marshall, Richard A., to GTE Automatic Electric Laboratories Incorporated. Line card for key telephone systems adapted to provide music during hold condition. 3,909,553, Cl. 179-99.000.

Marshall, Richard C., to Xerox Corporation. Scorotron power supply circuit. 3,909,614, Cl. 250-324.000.

Marshall, Robert H.: *See*—
Bajcar, Miles S.; Marshall, Robert H.; and Allen, William M., 3,908,537.

Martens, Jean Victor, to International Standard Electric Corporation. Balanced PCM encoder. 3,909,719, Cl. 325-38.00B.

Martin, Charles W.: *See*—
Follrath, Richard D.; Martin, Charles W.; Race, Russell L.; and McPherson, Gerald, 3,908,746.

Martin-Decker Company: *See*—
Bell, Leo A., 3,908,466.

Martin, Denzil O. Frying pan heat transfer plate. 3,908,534, Cl. 99-418.000.

Martin, Desaix B. Apparatus for squaring the upper end of a ground driven h-beam pile. 3,908,973, Cl. 266-23.00K.

Martin, Helmut; and Krisch, Lothar, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Method and system for providing power to booster amplifiers in h.f. cable network. 3,909,560, Cl. 179-170.00J.

Martin, William A. Vane type fluid motor. 3,909,158, Cl. 418-257.000.

Marvin Glass & Associates: *See*—
Breslow, Jeffery D.; and Jaworski, Eugene, 3,908,997.
McKay, Robert S.; Breslow, Jeffrey D.; and Glass, Marvin I., 3,908,303.
Meyer, Burton C., 3,908,989.
Morrison, Howard J.; Keller, Albert G.; and Nix, Donald F., 3,909,566.

Maryscuk, Thomas Paul; and Johnson, Lehman Holson, III, to International Telephone and Telegraph Corporation. Data and signaling multiplexing in PCM systems via the framing code. 3,909,540, Cl. 179-15.0BY.

Masaki, Akira; and Harada, Yutaka, to Hitachi, Ltd. Semiconductor large scale integrated circuit chip having current switching type logical circuits. 3,909,636, Cl. 307-303.000.

Masaki, Kenji, to Nissan Motor Company Limited. Misfiring detector for internal combustion engines. 3,908,366, Cl. 60-277.000.

Maschinenbau Greene GmbH & Co., KG: *See*—
Schulze, Wilheim, 3,908,924.

Maschinenfabrik Augsburg-Nurnberg AG: *See*—
Kreissl, Ottmar; and Pritsch, Eckhard, 3,909,673.

Maschinenfabrik Fahr Aktiengesellschaft: *See*—
Oni, Helmut; and Grabenhorst, Dieter, 3,908,345.

Maschinenfabrik Hasenclever GmbH: *See*—
Bothe, Werner, 3,908,436.

Mashinistov, Boris Fedorovich: *See*—
Razgulov, Mikhail Mikhailovich; Potekhina, Lidia Alexandrovna; and Mashinistov, Boris Fedorovich, 3,908,662.

Mason, Edwin E.: *See*—
Fretwell, Richard D.; Azbell, James W.; and Mason, Edwin E., 3,909,526.

Masonite Corporation: *See*—
Daunheimer, Lyn R.; and Irvine, William M., 3,908,588.

Massachusetts Institute of Technology: *See*—
Baghdady, Elie Joseph, 3,909,725.
Baker, Richard H.; and Bannister, Lawrence H., 3,909,685.
Smith, Joseph L., Jr., 3,909,684.

Massey-Ferguson, Inc.: *See*—
Noller, Fred W.; and Campbell, James Leroy, 3,908,843.

Master Lock Company: *See*—
Foote, Daniel J., 3,908,415.

Masuda, Takao: *See*—
Ikenoue, Shinpei; and Masuda, Takao, 3,909,271.

Masuda, Yoshio. Apparatus for preventing tangle of endless rope in mining or sea life gathering. 3,908,291, Cl. 37-69.000.

Masuko, Tatsuo: *See*—
Yamawaki, Takeshi; Masuko, Tatsuo; Yanagida, Osami; Yamamoto, Syunji; Inomata, Jihei; and Michishima, Susumu, 3,909,281.

Matarese, Ralph Jerome, to RCA Corporation. Separate interdigital electrodes without using any special photolithographic techniques. 3,908,263, Cl. 29-592.000.

Matsuda, Hirotoshi; Sugita, Osamu; and Inoue, Yuji, to New Nippon Electric Co., Ltd. Time controlled switching system with override control of manual operation. 3,909,620, Cl. 307-293.000.

Matsui, Hiroshi: *See*—
Tsuchida, Takayasu; Matsui, Hiroshi; Enei, Hitoshi; and Yoshinaga, Fumihiro, 3,909,353.

Matsui, Takeshi: *See*—
Oishi, Kazuo; Yamada, Takashi; and Matsui, Takeshi, 3,908,781.

Matsui, Yutaka; Kazama, Seiji; Nakabayashi, Masamitsu; and Kobayashi, Koji, to Takeda Chemical Industries, Ltd. Adhesive compositions of NCO-terminated prepolymer and rubber. 3,909,466, Cl. 260-3.000.

Matsumoto, Hirofumi: *See*—
Maekawa, Takehiko; Nakada, Masahiko; and Matsumoto, Hirofumi, 3,908,620.

Matsumoto, Seiji; Honjo, Satoru; Kawaziri, Kazuhiro; Tezuka, Sigeru; and Shiozawa, Etuo, to Fuji Photo Film Co., Ltd. Marking apparatus. 3,908,594, Cl. 118-637.000.

Matsumura, Masaru; Miyamoto, Yoshikazu; and Onishi, Yoshihiro, to Hitachi, Ltd. Optical processing apparatus. 3,909,112, Cl. 350-160.00R.

Matsunaga, Hisashi; Matsushita, Izumi; Iwayama, Kenzou; Motoyoshi, Minoru; Okamoto, Masafumi; Sakai, Tomohiko; and Shimadzu, Takahide, to Nippon Steel Corporation. Method for producing grain-oriented electrical steel sheet utilizing a continuous casting process. 3,908,737, Cl. 164-76.000.

Matsuno, Kazuo: *See*—
Tokura, Yasufumi; Matsuno, Kazuo; and Sakurai, Itaru, 3,909,801.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kawada, Toshio; Torama, Tadashi; and Kobayashi, Tamio, 3,909,844.
Kohashi, Tadao, 3,909,116.
Ohkubo, Tuneo; and Horiike, Yoshio, 3,909,539.
Oka, Shunzo; and Oshima, Kazuo, 3,909,770.
Sekido, Satoshi; and Fukuda, Sadao, 3,909,292.
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Matsushita Electronics Corporation: *See*—
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Matsushita Graphic Communication System, Inc.: *See*—
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Matsuyama, Chiaki: *See*—
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Matte, Claude; and Gener, Jean-Jacques, to Centre National de Transfusion Sanguine. Method and apparatus for distributing a liquid in the form of a multiplicity of doses. 3,908,716, Cl. 141-1.000.

Matte, Claude, to Centre National de Transfusion Sanguine. Analysis apparatus. 3,909,201, Cl. 23-253.00R.

Mattis, Donald J., to Sun Chemical Corporation. Spiral wound electrical heating element. 3,909,587, Cl. 219-270.000.

Maxant Button & Supply Co.: *See*—
Shepherd, Stephan C., 3,908,236.

Maxon, Leroy J. Conductivity measuring apparatus. 3,909,709, Cl. 324-30.000.

Mayer, Edward: *See*—
Sargent, Ronald J.; Vanden Broek, Christiaan J. H.; Henke, Arthur W.; Andersen, James M.; Stansbury, Benjamin H., Jr.; Kaminski, Stephen H.; and Mayer, Edward, 3,908,202.

Mayer, Edward A.: *See*—
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Mayfield, David N.: *See*—
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Mazier, Claude Marie Gaston Jacques, to Compagnie Honeywell Bull. Method and device for control of the transmission of data exchanged between a control processor and a plurality of peripheral devices. 3,909,782, Cl. 340-146.10R.

McAdams, Paul F., to Clark Equipment Company. Turbosupercharger exhaust. 3,908,369, Cl. 60-280.000.

McBride, Lyle E., Jr.: *See*—
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McCabe, Francis J. Backdraft damper. 3,908,529, Cl. 98-110.000.

McCann, Gary D. Centering sensor and controller. 3,908,881, Cl. 226-19.000.

McCartney, William B.: *See*—
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McCaw, Walter J.: *See*—
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McChesney, Herbert Raymond: *See*—
English, Paul Everitt; Ashcroft, Ian Reginald; Norris, Paul Alfred; Salter, Frank Michael; Laws, William Robert; and McChesney, Herbert Raymond, 3,908,459.

McClaflin, Gifford George, to Continental Oil Company. Cutting oil composition. 3,909,429, Cl. 252-46.700.

McClain, James E., to Esco Manufacturing Company. Electrical distribution networks incorporating means for sectionalizing faulted load sections. 3,909,677, Cl. 317-29.00R.

McClure, Clifford; and McClure, Marvin G. Motorcycle safety system. 3,908,780, Cl. 180-82.00R.

McClure, Marvin G.: *See*—
McClure, Clifford; and McClure, Marvin G., 3,908,780.

McConnell, Lorne D., to I-T-E Imperial Corporation. Self-operating fault current limiter switch. 3,909,676, Cl. 317-74.000.

McCosker, Doris C. Sanitary face mask. 3,908,648, Cl. 128-146.600.

McCourty, Ian Alexander; McKenzie, Howard Wood; and Oakland, Philip James, to Pilkington Brothers Limited. Cutting glass. 3,909,226, Cl. 65-97.000.

McCoy, David Ross, to Texaco Inc. Detergent compositions containing dioxolanes as surfactants and their preparation. 3,909,460, Cl. 252-532.000.

McCoy, Lyle E. Cold gelatin dye impregnation and sub-gelation warming to set dye. 3,909,191, Cl. 8-87.000.

McDonnell, Leo G. Vehicle safety system. 3,909,038, Cl. 280-150.00B.

McDowell-Wellman Engineering Company: *See*—
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McEvers, William R., Jr.: *See*—
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McFeeters, Melvin M.: *See*—
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McGahey, Dean C.; Vest, Eugene W.; and Mayer, Edward A., to Texaco Inc. Automatic fuel metering nozzle for a closed system. 3,908,721, Cl. 141-128.000.

McGeorge, Gerald G.: *See*—
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McGovern, William: *See*—
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McGrogan, John F.: *See*—
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McGuigan, Brian; Dellar, Richard John; and Phillips, William David, to Ciba-Geigy Corporation. Antioxidant composition. 3,909,448, Cl. 252-402.000.

McGuire, Stephen E.; Riddle, John L.; Nicks, Gene E.; Kerfoot, Oliver Carl; and Kennedy, Carl D., to Continental Oil Company. Preparation of synthetic hydrocarbon lubricants. 3,909,432, Cl. 252-59.000.

McIlroy, John C. Quick release safety trap. 3,908,208, Cl. 4-207.000.

McIntosh, Peter: *See*—
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McIntyre, Kevin M. Detecting impaired heart mechanical performance. 3,908,639, Cl. 128-2.05R.

McKay, Robert S.; Breslow, Jeffrey D.; and Glass, Marvin I., to Marvin Glass & Associates. Shift console including means for feeding and launching vehicles. 3,908,303, Cl. 46-1.00K.

McKenzie, Howard Wood: *See*—
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McKewan, William M., to Roessing Bronze Company. Recovery of both brass and zinc from metallurgical residues by carbon flotation method. 3,909,243, Cl. 75-24.000.

McKinney, Claude Owen: *See*—
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McPherson, Gerald: *See*—
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McVeigh, James M., to Xerox Corporation. Multi-color original for an electrophotographic printing system. 3,909,127, Cl. 355-4.000.

McWhorter, Edward M. Advanced reciprocating engine system. 3,908,623, Cl. 123-197.00A.

Mead Corporation, The: *See*—
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Meador, Jim D.: *See*—
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Meagher, George L., to General Electric Company. Tubing joint for adhesive bonding. 3,909,045, Cl. 285-22.000.

Meat Separator Corporation: *See*—
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Mechanical Technology Incorporated: *See*—
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Medtronic, Inc.: *See*—
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Meidell, Rolf W., to Lawrence Peska Associates, Inc., a part interest. Crushing device for household wastes. 3,908,541, Cl. 100-215.000.

Melnichenko, Igor Mikhailovich: *See*—
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Memorex Corporation: *See*—
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Menaut, Jean. Silo and means for removing particulate material therefrom. 3,908,839, Cl. 214-17.0DA.

Mend, William G.; and Anders, Roland A., to Westinghouse Electric Corporation. Readout system for a solid-state television camera. 3,909,520, Cl. 178-7.100.

Menk Apparatebau GmbH: *See*—
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Menke, Josef F., to Electro Optik GmbH & Co. Method of and device for modulating the center point in optical tracking devices. 3,909,104, Cl. 350-6.000.

Meoni, Dino. Programmed positioning device for the needle selection jacks in a jack support wheel of a circular jacquard knitting machine. 3,908,402, Cl. 66-1.00R.

Mermelstein, Seymour, to Tyco Laboratories, Inc. Vent cap for batteries. 3,909,302, Cl. 136-177.000.

Merritt, Clyde H., to Byron Jackson Inc. Slurry density averaging system and apparatus. 3,908,967, Cl. 259-153.000.

Messrs. Spectrospin AG: *See*—
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Metallgesellschaft Aktiengesellschaft: *See*—
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Meyer, Arnfried. Pressing apparatus for the pressure extracting of liquid. 3,908,413, Cl. 68-242.000.

Meyer, Burton C., to Marvin Glass & Associates. Skill type game utilizing tracks and vehicles. 3,908,989, Cl. 273-1.00R.

Meyer, Gene A.; and Jenkins, John S., to Chandler Evans Inc. Pump metering fuel control system. 3,908,360, Cl. 60-39.28R.

Meyer, Robert B.: *See*—
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Meyer, Victor E.: *See*—
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Meyerhofer, Dietrich, to RCA Corporation. Controlled angle viewing screens by interference techniques. 3,909,111, Cl. 350-117.000.

Meyerhofer, Dietrich, to RCA Corporation. Indexing system for microfiche viewer. 3,909,123, Cl. 353-27.000.

Meyers, Edward F., to Enviro-Gro, Inc. Self-starting plant marker and methods and apparatus for making same. 3,908,308, Cl. 47-56.000.

Michalko, Ignatius: *See*—
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Michel, Max, to Societe Francaise des Produits pour Catalyse. Trimetallic reforming catalyst and use thereof. 3,909,393, Cl. 208-139.000.

Michel, Rolf: *See*—
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Micro & Precision Mouldings (Cheltenham Limited): *See*—
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Microform Data Systems, Inc.: *See*—
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Midland-Ross Corporation: *See*—
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Milenkovic, Veljko, to Fuller Company. Antirotation device for a gyratory crusher. 3,908,915, Cl. 241-208.000.

Miles-Platts Limited: *See*—
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Miles, Terence Neville, to Miles-Platts Limited. Transformers. 3,909,761, Cl. 336-192.000.

Millard, Everett L. Heating and cooling control system for residential apartment or other multi-space buildings. 3,908,899, Cl. 236-46.000.

Miller, Adolph. Polyethylenimine adhesive. 3,909,469, Cl. 260-15.000.

Miller, Clarence D.; and Johnson, Paul R., to Chicago Bridge & Iron Company. Sliding radial key support for LNG ship tanks. 3,908,574, Cl. 114-74.00R.

Miller, Clyde A. Movable carrying structure. 3,909,042, Cl. 280-204.000.

Miller, Francis G.: *See*—
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Miller, Franz Friedrich: *See*—
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Miller, George E.; and Griffith, Michael J., to Outboard Marine Corporation. Outboard motor with dual cooling system. 3,908,579, Cl. 115-17.000.
Miller, Harlan E., to International Telephone and Telegraph Corporation. Disconnector circuit arrangement. 3,909,543, Cl. 179-18.00B.
Miller, Herscheal W. Support apparatus for a seat. 3,908,953, Cl. 248-421.000.
Miller, Joseph J.: *See—*
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Miller, Larry R.; and Leikarts, Aldis J., to Litton Business Systems, Inc. Modular display stand. 3,908,564, Cl. 108-111.000.
Miller, Ralph R., III; and Abraham, Donald D., to United States of America, Navy. Expendable volume reverberation profiler. 3,909,772, Cl. 340-3.00R.
Mills, Samuel M.: *See—*
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Milovancevic, Slavko. Coincidence timer. 3,909,731, Cl. 328-129.000.
Minatono, Shobu: *See—*
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Minolta Camera Kabushiki Kaisha: *See—*
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Mitamura, Kenichi; Ohtsuka, Kunio; and Miyauchi, Toshiyuki, to Nissan Motor Company Limited. Hydraulic control system of an automatic power transmission. 3,908,486, Cl. 74-869.000.
Mitscher, Herbert A.: *See—*
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Mitsubishi Chemical Industries, Ltd.: *See—*
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Miyano, Shizuo; Kishimoto, Shinzo; Yazawa, Kenichiro; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Process for producing presensitized planographic printing plate requiring no fountain solution. 3,909,265, Cl. 96-33.000.
Miyashita, Isuneo; Ozeki, Shoichiro; Nishio, Hiroaki; Nayuki, Tosio; Kobayashi, Tadashi; Suzuki, Gyoichi; and Murakami, Tadashi, to Nippon Kokan Kabushiki Kaisha. Method of manufacturing high quality reducing gas by two stage reforming processes. 3,909,446, Cl. 252-373.000.
Miyauchi, Toshiyuki; and Ohtsuka, Kunio, to Nissan Motor Company Limited. Automatic power transmission control system for reducing shocks when shifting from neutral to reverse drive conditions. 3,908,485, Cl. 74-867.000.
Miyauchi, Toshiyuki: *See—*
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Monaghan, Frank J. Method and apparatus for inducing localized analgesic condition. 3,908,634, Cl. 128-1.00R.
Monna, Takashi, to Kabushiki Kaisha Suwa Seikosha. Cash register. 3,909,604, Cl. 235-152.000.
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Morello, Herbert; and Mountford, George S., to Diebold, Incorporated. Entry gate construction for credit card actuated automatic remote banking equipment. 3,909,595, Cl. 235-61.11R.
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Mukai, Seiki; and Koge, Hironori, to Toyo Kogyo Co., Ltd. Cold starting device of a rotary piston internal combustion engine. 3,908,611, Cl. 123-8.130.
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Muller, Paul Curt; Kehl, Niklaus; and Kreis, Egon, to Kreis AG. Microwave tunnel-ovens. 3,909,574, Cl. 219-10.55A.
Mullins, Lynn D.; and Baldwin, Willett F., to Mobil Oil Corporation. Method and apparatus for logging flow characteristics of a well. 3,908,454, Cl. 73-155.000.
Multi-Fab, Inc.: *See*—
Gilmore, Guy T., 3,908,491.
Murakami, Hisakazu; Tsuji, Heigo; and Kaneko, Akira, to Nissan Motor Company Limited. Rear seat belt assembly. 3,909,041, Cl. 280-150.05B.
Murakami, Kunihiko; and Kaneda, Reiken, to Banzai Jidosha Kabushiki Kaisha. Roller drive-type compound vehicle wheel alignment tester. 3,908,280, Cl. 33-203.130.
Murakami, Tadashi: *See*—
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Murphy, Lonnie A., to Wadsworth-Greenwood Corporation. Apparatus for conveying elongated material such as textile material. 3,908,247, Cl. 28-1.00R.
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Naden, Rex A.; and West, Forrest G., Jr., to Texas Instruments Incorporated. Bubble memory minor loop redundancy scheme. 3,909,810, Cl. 340-174.0ED.
Nagahama, Tatsuya, to Mitsui Mining & Smelting Co., Ltd. Flotation machine. 3,909,413, Cl. 210-219.000.
Nagai, Hirosi; Katori, Kunihiko; Shiiki, Zenya; and Amagi, Yasuo, to Kureha Kagaku Kogyo K.K.; and Toyo Boseki Kabushiki Kaisha. Method for the production of activated carbon spheres. 3,909,449, Cl. 252-422.000.
Nagai, Tadashi; Irikura, Hitoshi; and Sasa, Kiminobu, to Nissan Motor Company Limited. Apparatus for supplying fuel to a dual-catalyst exhaust treatment system. 3,908,371, Cl. 60-301.000.
Nahara, Akira: *See*—
Tamai, Yasuo; Takimoto, Masaaki; Nahara, Akira; and Sato, Masamichi, 3,909,254.
Najour, Gerald Costa; and Witt, Peter Ray, to Emery Industries, Inc. Production of flame-retardant linear polyesters. 3,909,482, Cl. 260-40.00P.
Nakabayashi, Masamitsu: *See*—
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Nakagawa, Yunosuke; Hakozaki, Shori; and Sato, Koitsu, to Kao Soap Co., Ltd. Bleaching composition. 3,909,438, Cl. 252-186.000.
Nakai, Ikuo, to Miwa Lock Company, Ltd. Narrow profile door latch. 3,909,051, Cl. 292-166.000.
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Nakaya, Naohisa. Sampling oscilloscope having means for magnifying a part of an observed wave form along the time base. 3,909,671, Cl. 315-395.000.
Narasimham, Kapisthalam Chetlur: *See*—
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Neville, Richard Ernest Gartside; and Bardsley, Frank Baxter, to AMF Incorporated. Dispensing of particulate material. 3,908,817, Cl. 198-76.000.
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Newcomb, Morton Austin; and Bjorksten, Johan A., to Griffolyn Company, Inc. Snow load removal. 3,908,901, Cl. 237-81.000.
Newcomer, John L., to Amerock Corporation. Self-closing hinge. 3,908,228, Cl. 16-180.000.
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Niles, Earl Thomas, to Dow Chemical Company, The. Pyrotechnic disseminating formulation. 3,909,324, Cl. 149-76.000.
Nill, Reiner, to Brown, Boveri & Cie Aktiengesellschaft. Regulated AC to DC converter having a controllable rectifier assembly. 3,909,698, Cl. 321-10.000.
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Numagami, Kiyoshi; Okuyama, Toshiki; and Kato, Tadanari, to Nissan Motor Company Limited. Catalyst for promoting reduction of nitrogen oxides contained in exhaust gases. 3,909,456, Cl. 252-472.000.
Numbers, Jody L. Hood for the lens of optical instruments with pivotally mounted lens cover. 3,909,107, Cl. 350-58.000.
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O'Brien, Theodore Earl, to Patco Packing Limited. Apparatus for automatically stacking and compressing batts of compressible material. 3,908,539, Cl. 100-49.000.
Ochs, Gordon M.; and Wheeler, Raymond, to Tidland Corporation. Roll supporting mechanism. 3,908,926, Cl. 242-72.00B.

O'Connor, Ward F.; and Crawford, Ernest A., to Lummus Company, The. Fluidic jet positioner. 3,908,471, Cl. 74-18.100.
Oda, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Counting-rate meter. 3,909,715, Cl. 324-78.000.
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O'Hara, Mark J., to Universal Oil Products Company. Method of catalyst manufacture. 3,909,450, Cl. 252-438.000.
O'Hara, Mark J., to Universal Oil Products Company. Method of manufacturing a catalyst for the hydro-refining of residual oils. 3,909,453, Cl. 252-455.00R.
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Oka, Shunzo; and Oshima, Kazuo, to Matsushita Electric Industrial Co., Ltd. Variable-slide resistor including light source having intensity dependent upon resistor setting. 3,909,770, Cl. 338-119.000.
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Okada, Ryuzo, to Fuji Xerox Co., Ltd. Magnetic brush development apparatus utilizing magnetic means. 3,908,595, Cl. 118-637.000.
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Oni, Helmut; and Grabenhorst, Dieter, to Maschinenfabrik Fahr Aktiengesellschaft. Height control for implement support on an agricultural machine. 3,908,345, Cl. 56-208.000.
Onikov, Eduard Arshakovich; Zabotin, Alexandr Alexandrovich; Lileev, Valeryan Petrovich; Rutkevich, Zinovy Yakovlevich; Sakharov, Boris Alexandrovich; and German, Roman Anatolievich. Apparatus for propelling weft thread carriers in a travelling-wave loom. 3,908,706, Cl. 139-12.000.
Onishi, Yoshihiro: *See—*
Matsumura, Masaru; Miyamoto, Yoshikazu; and Onishi, Yoshihiro, 3,909,112.
Ono, Hisatake: *See—*
Seoka, Yoshio; Watarai, Syu; and Ono, Hisatake, 3,909,260.
Ono, Katsuhiro: *See—*
Tanaka, Kenjiro; Shigeta, Tadao; Kikkawa, Nobuyuki; Kumura, Noriharu; and Ono, Katsuhiro, 3,909,468.
Ono, Motoyuki: *See—*
Takaoka, Michio; Oshima, Hiroto; Katsuhara, Toshiharu; Ono, Motoyuki; Sano, Hideo; Seki, Masaichiro; and Hasegawa, Masakazu, 3,909,177.
Ono, Tasuku, to Stiron Chemical Industry Co. Ltd. Melody blowing device. 3,908,505, Cl. 84-83.000.
Onway Construction Company, Limited: *See—*
Horner, George Irwin, 3,908,560.
Oppenheimer, Robert H.: *See—*
George, Harvey F.; Oppenheimer, Robert H.; Marrara, Charles G.; and Cairns, David W., 3,909,138.
Orain, Michel, to Societe Anonyme: Glaenzer Spicer. Apparatus for cold-forming metal workpieces. 3,908,430, Cl. 72-353.000.
Ordway, Richard S.; Quinn, Richard E.; and Comeau, George O., to Circle Machine Co., Inc. Apparatus for spraying material with two fluids. 3,908,592, Cl. 118-313.000.
Ortiz, Nilson V. Leg supported crab trap. 3,908,301, Cl. 43-105.000.
Osborne, Raymond. Sun bath. 3,908,666, Cl. 128-372.000.
Osborne, Thomas Dixon, to Microdot Inc. Fastener. 3,908,727, Cl. 151-7.000.
Oshima, Hiroto: *See—*
Takaoka, Michio; Oshima, Hiroto; Katsuhara, Toshiharu; Ono, Motoyuki; Sano, Hideo; Seki, Masaichiro; and Hasegawa, Masakazu, 3,909,177.
Oshima, Kazuo: *See—*
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Oshima, Noboru: *See—*
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Ostrowsky, Efrem M.: *See—*
Crowle, William G.; and Ostrowsky, Efrem M., 3,908,906.
Oswin, Harry G.; and Bay, Howard W., to Energetics Science, Inc. Gas detector unit. 3,909,386, Cl. 204-195.00R.
Otsubo, Hideo: *See—*
Akayama, Jinichi; Yokozeki, Masanori; Otsubo, Hideo; and Igata, Sueta, 3,909,315.
Ott, Louis E., to Standard Oil Company. Plant nutrients. 3,909,229, Cl. 71-64.00C.
Otto, Alfred; Feldhoff, Hermann Josef; Kupiek, Heinrich; and Brackelmann, Gerd, to Bergische Stahl-Industrie; and Montanhydraulik GmbH Co. KG. Adjusting device for brakes. 3,908,803, Cl. 188-71.800.
Ouellette, Ronald J.; Canney, Robert S.; and Stetson, Ralph B., to General Electric Company. Bushing well for instrument transformer and transformers including such well. 3,909,759, Cl. 336-84.000.
Outboard Marine Corporation: *See—*
Granholm, Lars E., 3,908,895.
Miller, George E.; and Griffith, Michael J., 3,908,579.
Van Rens, Russell J., 3,908,607.
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Moscovita, Peter A., 3,909,341.
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Oxford Industries, Inc.: *See—*
Agan, Ernest W., Jr.; Childers, Grady P.; Frost, Walter Wade; and Hunter, John P., Jr., 3,908,250.
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Creutz, Hans-Gerhard, 3,909,373.

Oyafuso, Robert T.: *See*—
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Ozaki, Nobuo; and Kawai, Sadao, to Maeda Industries, Ltd. Bicycle three-speed hub. 3,908,807, Cl. 192-6.00A.

Ozeki, Shoichiro: *See*—
Miyashita, Isuneo; Ozeki, Shoichiro; Nishio, Hiroaki; Nayuki, Tosio; Kobayashi, Tadashi; Suzuki, Gyoichi; and Murakami, Tadashi, 3,909,446.

P. R. Mallory & Co., Inc.: *See*—
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Pound, Virgil E., 3,909,036.

Packard Industries, Inc.: *See*—
Hogue, Norman E., 3,908,320.

Pactosan AB: *See*—
Forslund, Per Anders Goran, 3,908,336.

Padden, William R. Vertical blower coil unit for heating and cooling. 3,908,752, Cl. 165-35.000.

Page, Lewis C., Jr. Measuring system. 3,909,519, Cl. 178-6.800.

Page, Robert E. Portable pulse sensor. 3,908,636, Cl. 128-2.05T.

Page, Robert E. Cardiovascular instrument. 3,908,640, Cl. 128-2.05T.

Page, Robert E.: *See*—
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Paine, David L.: *See*—
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Painter, Walter Charles: *See*—
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Paletzki, Hans Joachim, to Georgetown Steel Corporation. Coil-compacting machine and method. 3,908,712, Cl. 140-1.000.

Pall Corporation: *See*—
Cooper, Roydon B., 3,908,693.

Palleson, Gormen C.: *See*—
Rossi, Joseph R.; Griffiths, Frederick J.; Griffin, James L.; and Palleson, Gormen C., 3,908,593.

Palmenberg, Edward C.: *See*—
Wachtell, Richard L.; and Palmenberg, Edward C., 3,909,157.

Palombo, Gaston Albert; and Brecy, Andre Achille, to Compagnie Honeywell Bull. Reference signal generator, particularly for the control of a direct-current motor. 3,909,734, Cl. 328-181.000.

Palumbo, Dominic T., deceased: *See*—
Shaffer, Francis N.; Palumbo, Dominic T., deceased; and Palumbo, Frances A., administratrix, 3,909,443.

Palumbo, Frances A., administratrix: *See*—
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Panduit Corporation: *See*—
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Panicci, Richard L., to Kiddie Products, Inc. Shoelace keeper. 3,908,238, Cl. 24-119.000.

Pannullo, Louis A.; and MacKenzie, Donald D., to American Chain & Cable Company. Open channel flow measuring device. 3,908,458, Cl. 73-198.000.

Paris, Rene Antoine; Amblard, Paul Alexis; and Rousset, Abel Claude. Production of metals and metal alloys of high purity. 3,909,247, Cl. 75-84.10R.

Park-Ohio Industries, Inc.: *See*—
Armstrong, Robert G.; and Nebesar, George C., 3,909,314.

Parker, Edward H.; Harris, Edward M.; and Meador, Jim D., to Western Litho Plate & Supply Co. Lithographic plate comprising a light-sensitive polymer. 3,909,269, Cl. 96-86.00P.

Parker, Edward T.; and Lundsted, Lester G., to BASF Wyandotte Corporation. Method of treatment of wood pulp for greater efficiency in wood utilization. 3,909,345, Cl. 162-72.000.

Parker, John J.: *See*—
Morawski, London T.; and Parker, John J., 3,909,021.

Parkinson, Peter: *See*—
Watson, Douglas John; and Parkinson, Peter, 3,909,536.

Parks-Cramer Company: *See*—
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Partridge, Drexel C. Total ventilating and scavenging system for an internal combustion engine. 3,908,617, Cl. 123-119.00B.

Patco Packing Limited: *See*—
O'Brien, Theodore Earl, 3,908,539.

Patrie, Jos; and Allegret, Francis, to Societe de Vente de l'Aluminium Pechiney. Method for creating a polychrome motif on an object made of aluminum or aluminum alloy. 3,909,367, Cl. 204-18.00R.

Patry, Francis Joseph, to Johns-Manville Corporation. Roof drain arrangement. 3,909,412, Cl. 210-166.000.

Patterson, Maurice M.; and Sheffield, Bass C., to Shell Oil Company. Method for determining liquid production from a well. 3,908,761, Cl. 166-250.000.

Pattynama, Philip W.: *See*—
Schuyf, Willem; Tent, Bart; Pattynama, Philip W.; and deKlerk, Frans, 3,908,769.

Pavey, George M., Jr., to Whitehall Corporation. Controlled buoyancy system for seismic streamer sections. 3,909,774, Cl. 340-7.0PC.

Payne, C. Lee, Jr.; and Gambello, Vincent J., to Sea Pines Company. Knockdown rocking chair. 3,909,064, Cl. 297-440.000.

Payne, Sidney H.: *See*—
Gadd, Ronald O. C.; Payne, Sidney H.; and Barton, George C., 3,908,216.

Payne, William J., to Modulus Corporation. Strain indicator. 3,908,508, Cl. 85-62.000.

PBR Company: *See*—
Frazelle, Ronald B.; and Fuller, Neal B., 3,908,566.

Pearce, Jai Kumar: *See*—
Baum, Kurt; Baum, Joerg Peter; Pearce, Jai Kumar; and Schroeder, David Lee, 3,908,969.

Pearsall, Duane D.: *See*—
Coulter, Gordon L.; and Pearsall, Duane D., 3,908,309.

Pechini, Maggio P. Method for making a monolithic ceramic capacitor with silver bearing electrodes. 3,909,327, Cl. 156-89.000.

Peck, Robert D., to Hewlett-Packard Company. Regulation and stabilization in a switching power supply. 3,909,695, Cl. 321-2.000.

Peddinghaus, Werner: *See*—
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Peirish, Alfred J., Jr., to International Telephone and Telegraph Corporation. Liquid dispenser. 3,908,868, Cl. 222-145.000.

Pelak, Andrew; and Michelsohn, Fred H., to Curtiss-Wright Corporation. Flat bottom reference reflectors for ultrasonic inspection. 3,908,439, Cl. 73-1.00R.

Pellegrino, James A.: *See*—
Kaelin, George R.; and Pellegrino, James A., 3,909,788.

Pelzer, Rudolph H. Envelope device. 3,908,892, Cl. 229-73.000.

Pennec, Jean-Claude, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Seal and decorative strip assembly for sliding window of vehicle. 3,908,312, Cl. 49-493.000.

Pennsylvania Engineering Corporation: *See*—
Baum, Kurt; Baum, Joerg Peter; Pearce, Jai Kumar; and Schroeder, David Lee, 3,908,969.

Penntube Plastics Company: *See*—
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Pennwalt Corporation: *See*—
Mandell, Harry Creston, Jr., 3,909,476.

Peppler, William S.; and Beinssen, Hans W., to Diamond International Corporation. Method and means for washing eggs, including tilted brushes. 3,909,290, Cl. 134-6.000.

Periard, Jacques: *See*—
Riess, Gerard; Periard, Jacques; and Banderet, Albert, 3,909,478.

Perkin-Elmer Corporation: *See*—
Huchital, David A.; and Steinberg, George N., 3,909,736.

Perry, Kenneth E., to Winfield Brooks Company, Inc. Abrasive composition containing a gel and a boron-dialkyl silicon-oxygen polymer. 3,909,217, Cl. 51-298.000.

Perry, Walter Merton. Container opening segment with swivel attachment. 3,908,856, Cl. 220-269.000.

Peter, Udo. Apparatus and method of clearance and vibration measurement in rotary machines. 3,908,444, Cl. 73-71.300.

Peters, Heinrich: *See*—
Kerner, Walter; Mahler, Friedrich; and Peters, Heinrich, 3,908,904.

Peters, Howard M.: *See*—
Hendry, Dale G.; Hill, Marion E.; and Peters, Howard M., 3,909,497.

Petersen, Harry Arthur; Kinnan, Mike; and Evans, Frederick Drew, Jr. Toy inertial projectile launcher. 3,908,306, Cl. 46-199.000.

Peterson, A. Duane, to Bendix Corporation, The. Rotor assembly for permanent magnet generator. 3,909,647, Cl. 310-156.000.

Peterson, Carl R., to Foster-Miller Associates. High energy rate actuator. 3,908,373, Cl. 60-371.000.

Petri, Ralph E., to Rock-Ola Manufacturing Corporation. Cabinet and heat sink for amplifier components. 3,909,679, Cl. 317-100.000.

Petrinec, Robert G. Wing support for model aircraft. 3,908,976, Cl. 269-40.000.

Petro, James; and Rively, Clair M., to Westinghouse Electric Corporation. Apparatus for manufacturing embryonic wire coils having noduled ends. 3,909,583, Cl. 219-121.00L.

Petrolite Corporation: *See*—
Redmore, Derek, 3,909,200.
Redmore, Derek; and Woodson, Alfred E., 3,909,447.

Petrovich, Vojislav. Froth flotation method for recovery of minerals. 3,909,399, Cl. 209-166.000.

Phares, Earl K.; and Lewis, Alfred H., to S. G. Taylor Chain Company, Inc. Chain link heat treating apparatus and method. 3,909,575, Cl. 219-50.000.

Phares, Earl K., to S. G. Taylor Chain Company, Inc. Chain link and joiner heater. 3,909,576, Cl. 219-51.000.

Phelps, Howard Neile, Jr.; and Dinsmore, Daniel, Jr., to United States of America, Navy. Sonar dome window damping and application procedure. 3,908,790, Cl. 181-198.000.

Philip Morris Incorporated: *See*—
Rainer, Norman B.; and Wilson, Peter Allen, 3,909,455.

Phillips, David: *See*—
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Phillips Petroleum Company: *See*—
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Phillips, William David: *See*—
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Pickering, Norman C.; and Bronson, Nathaniel R., II. Ophthalmic B-scan apparatus. 3,909,771, Cl. 340-1.00R.
Pietzsch, Ludwig; Huhne, Gerd; Overlach, Knud; and Fuchs, Peter. Overload safety device for telescopic cranes. 3,909,817, Cl. 340-267.00C.
Pieuchard, Guy; Flamand, Jean; and Cordelle, Jean, to Jobin-Yvon. Monochromator with a concave grating. 3,909,134, Cl. 356-99.000.
Pike, Roscoe A., to United Technologies Corporation. Oxidatively stable modified polyphenylquinoxaline resin. 3,909,481, Cl. 260-37.00N.
Pilkington Brothers Limited: *See—*
Dickinson, George Alfred, 3,909,227.
McCourty, Ian Alexander; McKenzie, Howard Wood; and Oakland, Philip James, 3,909,226.
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Recks, John A.; Cassarino, Frank V., Jr.; Getson, Edward F., Jr.; Laubscher, Karl F.; McLaughlin, Albert T.; and Pinheiro, Edwin J., 3,909,799.
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Pioneer Electronic Corporation: *See—*
Kinoshita, Shouzo; and Ishikawa, Shinichi, 3,909,557.
Sakai, Yasunori, 3,909,008.
Piquette, Gerald. Planetary reverse transmission. 3,908,483, Cl. 74-792.000.
Piszel, Geza A. Golf club. 3,909,005, Cl. 273-171.000.
Pitteroff, Walter A.: *See—*
Mueller, Andrew G.; Krumpelt, Michael; Pitteroff, Walter A.; Argade, Shyam D.; and Louvar, Joseph F., 3,909,382.
Pittet, Rene E., Jr.; and Grant, Philip J., to Tekonsha Engineering Company. Towed vehicle electric brake control system. 3,909,075, Cl. 303-24.00C.
Place, William. Tow truck. 3,908,842, Cl. 214-86.00A.
Plastics, Inc.: *See—*
Springer, Donald A., 3,909,089.
Plaw, Graeme Raymond, to Stanley Works, The. Rotary hand tool. 3,908,487, Cl. 81-59.100.
Plock, Karl: *See—*
Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, 3,908,717.
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Plummer, Jan P., to Custom Electronics Incorporated. Acoustic transducer system. 3,909,531, Cl. 179-1.00E.
Pneumo Dynamics Corporation: *See—*
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Pohlman, Joe C., to Vertical Transport Company. Vertical hoist assembly. 3,908,801, Cl. 187-88.000.
Polaris Fabrikker A.S.: *See—*
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Polaroid Corporation: *See—*
Bloom, Stanley M., 3,909,264.
Stella, Joseph A., 3,909,120.
Wray, William R., 3,909,843.
Polkinghorn, Robert W.: *See—*
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Pollard, Bernard Robert, to Jones & Laughlin Steel Corporation. Method and apparatus for gas shrouding of liquids. 3,908,734, Cl. 164-66.000.
Polss, Perry, to Du Pont de Nemours, E. I., and Company. Multifunctional gasoline additive compositions. 3,909,214, Cl. 44-58.000.
Polymer Machinery Corporation: *See—*
Witzel, Hans G., 3,908,697.
Pons, Henry Wolfgang: *See—*
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Popham, James A. Fabric reel. 3,908,932, Cl. 242-222.000.
Porcher, Alain; and Lefevre, Edouard, to Burroughs Wellcome Co. Blood sampling device. 3,908,638, Cl. 128-2.00F.
Porter, Clark A., to Monsanto Company. Method for increasing the sucrose content of growing plants. 3,909,233, Cl. 71-86.000.
Porter, Clive, to Motter Printing Press Co. Plate clamping mechanism for printing cylinder. 3,908,546, Cl. 101-378.000.
Porter, Henry H.: *See—*
Goss, Wilbur H.; Porter, Henry H.; Roberts, Richard B.; Tuve, Merle Antony; Beams, Jesse W.; and Selvidge, Harner, 3,908,933.
Portz, William E., to True Temper Corporation. Yoke for game racket. 3,908,995, Cl. 273-73.00G.
Posselt, Manfred, to G. Siempelkamp & Co. Apparatus for forming a laminate in a heated-platen press. 3,909,343, Cl. 156-538.000.
Post Office, The: *See—*
Ritchie, William Kerr, 3,909,756.
Potekhina, Lidia Alexandrovna: *See—*
Razgulov, Mikhail Mikhailovich; Potekhina, Lidia Alexandrovna; and Mashinistov, Boris Fedorovich, 3,908,662.
Pottage, Paul Richmond: *See—*
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Poulsen, Harold W., to Universal Oil Products Company. Solar heat absorbing system. 3,908,632, Cl. 126-271.000.
Pound, Virgil E., to Paccar Inc. Rough duty air-suspension system for trucks and the like. 3,909,036, Cl. 280-124.00F.
Powell, Eugene L.; and McGeorge, Gerald G., to American Maize Products Company. Process for recovery of starch and corn oil from corn. 3,909,288, Cl. 127-68.000.
Powell, Thomas C.: *See—*
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Power Conversion, Inc.: *See—*
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PPG Industries, Inc.: *See—*
Carroll, Thomas D., 3,908,351.
Prager, Franz Hermann: *See—*
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Prameta Prazisionsmetall und Kunststofferzeugnisse G. Baumann & Co.: *See—*
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Prast, Gijsbert; and Mulder, Jan, to U.S. Philips Corporation. Cooling system. 3,908,397, Cl. 62-514.000.
Pravaz, Marcel H., to Etudes et Fabrications Aeronautiques. Parachute. 3,908,938, Cl. 244-152.000.
Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See—*
Heine, Henry; and Feinberg, Irving, 3,908,416.
Price, James A.; and Sharp, Vol W. Fillet board. 3,908,231, Cl. 17-70.000.
Price, Ralph E.; and Bricker, Robert E., to Landis Tool Company. Machine tool. 3,908,627, Cl. 125-11.0TP.
Prigmore, Daryl R.: *See—*
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Pritsch, Eckhard: *See—*
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Purdue Research Foundation: *See—*
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Cloud, Charles E.; and Hartman, Donn Allan, 3,908,979.
Rabiner, Lawrence Richard; Rosenthal, Lewis Hyman; and Schafer, Ronald William, to Bell Telephone Laboratories, Incorporated. Apparatus and method for determining the beginning and the end of a speech utterance. 3,909,532, Cl. 179-1.0SC.
Rabinovich, Luis J. Area-matching puzzle-game. 3,909,003, Cl. 273-157.00R.
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Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, to Holstein & Kappert Maschinenfabrik Phonix GmbH. Apparatus for filling beer cans or the like. 3,908,717, Cl. 141-46.000.
Radford, Leslie M. Mailbox alarm. 3,909,819, Cl. 340-281.000.
Radice, Michael: *See—*
Levine, Sol; and Radice, Michael, 3,908,676.
Rafael, Johann. Device for damping the surge of water waves particularly for a floating body designed to clean polluted water. 3,909,417, Cl. 210-242.000.
Raich, Henry: *See—*
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Raikhman, Yakov Aronovich: *See—*
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Rainer, Norman B.; and Wilson, Peter Allen, to Philip Morris Incorporated. Catalyst and process for making same. 3,909,455, Cl. 252-466.00J.

Rainone, Nicholas J.: *See*—
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Raitt, Edward D. Apparatus for flavoring soft ice cream being dispensed from a machine. 3,908,867, Cl. 222-145.000.
Rajpal, Shashi M.: *See*—
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Ralph Pill Electric Supply Company: *See*—
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Randall, Leslie L., to Monsanto Company. Assemblies for making cable beads. 3,908,713, Cl. 140-71.00R.
Randleman, Patrick L.: *See*—
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Rannenberg, George C., to United Aircraft Corporation. Variable size bleed port for jet engines. 3,909,152, Cl. 415-27.000.
Raque, Glen F., to FMC Corporation. Heat sealing machine. 3,908,342, Cl. 53-329.000.
Raque, Robert G., to FMC Corporation. Pizza topping machine. 3,908,584, Cl. 118-2.000.
Raske, Hans, to Siemens Aktiengesellschaft. Apparatus for ultrasonic welding. 3,908,886, Cl. 228-1.000.
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Raymond, John L.: *See*—
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Raymond, Louis W.; and Reath, Roger E. Electroplating method and apparatus. 3,909,368, Cl. 204-26.000.
Raymond, William R.; and Stefansson, Rafn, to Bell & Howell Company. Information coding with error tolerant code. 3,909,784, Cl. 340-146.1AV.
Raytheon Company: *See*—
Daly, Edward J., 3,909,829.
Wallach, Steven J.; Deerfield, Alan J.; and Nissen, Stanley M., 3,909,798.
Razgulov, Mikhail Mikhailovich; Potekhina, Lidia Alexandrovna; and Mashinistov, Boris Fedorovich. Device for the eversion of hollow organs and vascular stapling instrument incorporating same. 3,908,662, Cl. 128-334.00R.
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Recks, John A.; and Pinheiro, Edwin J., to Honeywell Information Systems Inc. Improved microprogrammed peripheral processing system. 3,909,800, Cl. 340-172.500.
Redfield, Charles L.; Schultz, Robert G.; and Van Art, Arne, to Litton Medical Products, Inc. Method and apparatus for checking the superimposition of an x-ray field and a lightfield. 3,909,616, Cl. 250-491.000.
Redford, David Arthur, to Texaco Exploration Canada Ltd. Method for establishing communication path in viscous petroleum-containing formations including tar sand deposits for use in oil recovery operations. 3,908,762, Cl. 166-263.000.
Redmore, Derek, to Petrolite Corporation. Use of guanidine derived compounds as corrosion inhibitors. 3,909,200, Cl. 21-2.70R.
Redmore, Derek; and Woodson, Alfred E., to Petrolite Corporation. Mixtures of thiophosphates, oxygen phosphates and pyrophosphates. 3,909,447, Cl. 252-389.00A.
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Reed, William Dale. Knife retainer. 3,908,499, Cl. 83-665.000.
Reehil, Edward G.; and Steiner, Edward L., to Xerox Corporation. Stepper motor control. 3,909,125, Cl. 355-3.000.
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Reinhardt, Eugen, to Ernst Reinhardt GmbH. Rotational speed measuring device, particularly for rotary casting installations and the like. 3,908,469, Cl. 73-507.000.
Reiter, David. Dental retainer. 3,908,273, Cl. 32-63.000.
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Ribback, Bernd. Hammer forging device. 3,908,434, Cl. 72-400.000.
Riboulet, Robert; and Galery, Yves, to La Cellophane. Adjustable flat spinneret for the coextrusion of flat films comprising a plurality of components. 3,909,170, Cl. 425-133.500.
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Ricobene, Sam; and Dunn, Lyman D. Food container assembly. 3,908,852, Cl. 206-550.000.
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Riedhammer, Josef, to Hydromatik GmbH. Control system for a hydrostatic transmission. 3,908,377, Cl. 60-445.000.
Rieger, Werner. Overload testing of chains. 3,908,452, Cl. 73-143.000.
Riess, Gerard; Periard, Jacques; and Banderet, Albert, to Agence Nationale de Valorisation de la Recherche (ANVAR). Plasticized copolymers. 3,909,478, Cl. 260-31.40R.
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Rietz, Wolfdietrich; Knutz, Otto; and Neubert, Erhard, to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel. Circuit arrangement for measuring high ohmic cable faults in telecommunication and similar networks. 3,909,712, Cl. 324-52.000.
Rieve, Robert W.; and Shalit, Harold, to Atlantic Richfield Company. Recovery of aluminum chloride/palladium chloride hydrocracking catalyst mixture. 3,909,391, Cl. 208-108.000.
Rifkin, Alfred A.; and Staats, Robert Wallace, to International Business Machines Corporation. Packaging structure for a plurality of wafer type integrated circuit elements. 3,909,678, Cl. 317-100.000.
Riggs, Royal W. Odometer for boats. 3,908,456, Cl. 73-183.000.
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Rist, Michel Theophile. Assistance device for a control especially a clutch control for automobiles. 3,908,514, Cl. 91-391.00R.
Ristvedt, Victor G.; and Johnson, Roy B. Coin wrapper forming apparatus. 3,908,525, Cl. 93-81.0MT.
Ritchie, William Kerr, to Post Office, The. Waveguide support system comprising a liquid-filled duct. 3,909,756, Cl. 333-95.00R.
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Romberg, Felix B. Traction gate. 3,908,311, Cl. 49-381.000.
Romy, Stephen. Spark plug with built-in precombustion chamber. 3,908,625, Cl. 123-32.0SP.
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Rose, Fritz; Bechthold, Horst; Bieniok, Paul; and Stein, Dieter, to Metallgesellschaft Aktiengesellschaft. Process for directly reducing iron ores in the solid state under pressure. 3,909,244, Cl. 75-35.000.
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Roskelley, M. Leon. Variable speed motor driven machine tool. 3,908,492, Cl. 82-29.00R.
Ross, Arthur W. Method for stringing power lines. 3,908,962, Cl. 254-134.30R.
Ross, Benjamin. Mold for making fluid containing structure. 3,909,178, Cl. 425-425.000.
Ross, Edgar A., to Southern Weaving Company. Woven electrically conductive cable and method. 3,909,508, Cl. 174-117.00M.
Ross, Joseph. Swing-over snow wing. 3,908,289, Cl. 37-41.000.
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Roth, James E.; and O'Hearne, Robert L., to Intertherm, Inc. Bus bar terminal means for pairs of circuit-braking elements. 3,909,097, Cl. 339-19.000.
Rothlisberger, Kurt; and Vee, Richard F., to Teletype Corporation. Apparatus and method for sensing the condition of a tape within a tape cassette. 3,909,845, Cl. 360-74.000.
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Roy, Joseph A.; and Bradway, Gary C., to GTE Sylvania Incorporated. Method of making beaded filament coil. 3,908,251, Cl. 29-25.170.
Rozema, Arthur L.; and Alm, Howard G., to CTS Corporation. Variable voltage divider. 3,909,769, Cl. 338-48.000.
RTE Corporation: *See—*
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Runge, Hartmut: *See—*
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Ruske, Manfred, to BASF Aktiengesellschaft. Surface coatings or plastics colored with an anthraquinoneoxadiazole. 3,909,471, Cl. 260-22.00R.
Russel, Donald R. Device for tabling length of draperies. 3,908,294, Cl. 38-104.000.
Russell, Wayne B., Jr. Trailer hitch. 3,909,033, Cl. 280-477.000.
Russmann, Gerd; and Fauser, Hans, to J. M. Voith, GmbH. Method and apparatus for regulating the motion of a web. 3,908,880, Cl. 226-3.000.
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Ryan, Richard A.; and Galeone, Vincent A., to Dow Chemical Company, The. Apparatus for solvent removal. 3,908,285, Cl. 34-77.000.
Rychiger, Hans, to Alupak AG. Apparatus for hermetic closure of filled containers. 3,908,334, Cl. 53-86.000.
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Salmela, Gordon O. Rotary rolling conduit. 3,909,047, Cl. 285-119.000.
Salomon, Georges Pierre Joseph, to S.A. Etablissements Francois Salomon & Fils. Devices for braking loose skis. 3,909,024, Cl. 280-11.13B.
Salomon, Georges Pierre Joseph, to S.A. Etablissements Francois Salomon & Fils. Releasable safety device for a ski boot. 3,909,026, Cl. 280-11.35T.
Salomon, Georges Pierre Joseph, to S.A. Etablissements Francois Salomon & Fils. Safety strap for a ski boot. 3,909,027, Cl. 280-11.35N.
Salomon, Georges Pierre Joseph. Process for safety release of a ski boot and binding for carrying said process. 3,909,029, Cl. 280-11.35T.
Salt, Trevor L., to General Electric Company. Method of measuring article fatigue life. 3,908,447, Cl. 73-91.000.
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Sasaki, Yoshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil seal means of a rotary piston engine. 3,909,166, Cl. 418-142.000.
Sasayama, Takao, to Hitachi, Ltd. Ignition device for use in internal combustion engine. 3,908,616, Cl. 123-117.00R.
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Nakagawa, Yunosuke; Hakozaki, Shori; and Sato, Koitsu, 3,909,438.
Sato, Masamichi, to Xerox Corporation. Cleaning process. 3,909,383, Cl. 204-186.000.
Sato, Masamichi: *See—*
Tamai, Yasuo; Takimoto, Masaaki; Nahara, Akira; and Sato, Masamichi, 3,909,254.
Sato, Mikio: *See—*
Ogata, Masatzugu; Tada, Ritsuro; Wajima, Motoyo; Kitamura, Masahiro; Suzuki, Hiroshi; Sato, Mikio; and Kubo, Etuzi, 3,909,480.
Sato, Minoru: *See—*
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Sato, Takashi: *See—*
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Satorius, Walter, to Jemco Engineering Co. Flashing indicator apparatus. 3,909,812, Cl. 340-227.00R.
Saunders & Dudley Limited: *See—*
Dudley, Albert Edward Frederick, 3,908,776.
Sausse, Andre: *See—*
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Saygin, Ferdi, to Henkel & Cie G.m.b.H. Hair dyeing process and composition containing α-cyano-methanesulfonamido-nitrobenzene derivatives. 3,909,190, Cl. 8-10.100.
SCA Development Aktiebolag: *See—*
Bohlin, Gunnar Karl; and Eriksson, Rune Karl, 3,908,772.
Schaa, Wolfgang: *See—*
Bielfeldt, Friedrich Bernd; and Schaa, Wolfgang, 3,908,968.
Schaer, Hans, to Fabrique de Machinen Andre Bechler SA. Apparatus for controlling the forward and return movement of a drilling spindle. 3,909,150, Cl. 408-17.000.
Schafer, Ronald William: *See—*
Rabiner, Lawrence Richard; Rosenthal, Lewis Hyman; and Schafer, Ronald William, 3,909,532.
Schaffer, Bernhard: *See—*
Kammerl, Anton; and Schaffer, Bernhard, 3,909,511.
Schaffner, Gus J., III, to Schaffner Manufacturing Company, Inc. Flap for a flap-type finishing wheel. 3,908,319, Cl. 51-394.000.
Schaffner Manufacturing Company, Inc.: *See—*
Schaffner, Gus J., III, 3,908,319.
Schaller, Robert L., to Sundstrand Syracuse, Inc. Grinding machine systems. 3,908,315, Cl. 51-103.00R.
Scheidweiler, Andreas; and Thalmann, Hanspeter, to Cerberus AG. Ionization-type fire sensor. 3,909,813, Cl. 340-237.00S.
Scheingold, William Samuel; Purdy, Harold Lawrence; and Youngflesh, Frank Christian, to AMP Incorporated. Keyboard assembly with foldable printed circuit matrix switch array, and key actuator locking slide plate. 3,909,564, Cl. 200-5.00E.
Schellenbaum, Max: *See—*
Duennenberger, Max; and Schellenbaum, Max, 3,909,436.
Schenk, Raymond L., Jr.; and Keizer, Alan S., to Gould Inc. Minimizing oxidation in positive displacement casting. 3,908,740, Cl. 164-80.000.
Schenk, Raymond L., Jr.; Cushman, Robert Holbrook; and Keizer, Alan S., to Gould Inc. Apparatus for positive displacement bonding. 3,908,742, Cl. 164-80.000.
Schenk, Raymond L., Jr.; and Bruzas, John A., to Gould Inc. Positive displacement casting system employing shaped electrode for effecting cosmetically perfect bonds. 3,908,743, Cl. 164-80.000.
Schenk, Raymond L., Jr.; and Hayes, William B., to Gould Inc. Positive seal for batteries employing plastic casings. 3,909,300, Cl. 136-134.00R.
Schenk, Raymond L., Jr., to Gould Inc. Positive displacement bonding. 3,909,301, Cl. 136-134.00R.
Schieber, Hans, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Needle clamp for straight knitting machines. 3,908,405, Cl. 66-78.000.
Schiff, Sidney, to Phillips Petroleum Company. Additives for lubricants and motor fuels. 3,909,427, Cl. 252-33.000.
Schiffelers, Theodoor Gerardus Maria, to Beondu A.G. Boiler and elements therefor. 3,908,603, Cl. 122-209.00R.
Schildmeier, Alice F.; Schildmeier, J. Henry; and Mitscher, Herbert A. Plural transceiver alarm system using coded alarm message and every station display of alarm origin. 3,909,826, Cl. 340-412.000.
Schildmeier, J. Henry: *See—*
Schildmeier, Alice F.; Schildmeier, J. Henry; and Mitscher, Herbert A., 3,909,826.
Schimanski, Georg: *See—*
Von Philipp, Fritz; and Schimanski, Georg, 3,908,905.

Schimke, Thomas O.; and Cushing, Donald S., to General Electric Company. Forced air circulation system for a dishwasher. 3,908,681, Cl. 134-94.000.
Schloeman, Robert W., to Sperry Rand Corporation. Programmed gain control for aircraft throttle control system. 3,908,934, Cl. 244-77.00D.
Schloemann-Siemag Aktiengesellschaft: *See—*
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Schlumberger Technology Corporation: *See—*
Lavigne, Jean C., 3,909,775.
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Schmaedeke, Ruth H.; Schmaedeke, Wayne W.; Ericson, Gloria J.; and Ericson, Lennart A. Ski holder. 3,909,031, Cl. 280-11.37K.
Schmaedeke, Wayne W.: *See—*
Schmaedeke, Ruth H.; Schmaedeke, Wayne W.; Ericson, Gloria J.; and Ericson, Lennart A., 3,909,031.
Schmermund, Alfred. Method of, and device for, providing a web of packaging material with a tear strip. 3,909,330, Cl. 156-252.000.
Schmid, Hans; and Feldhoff, Heinrich, to BASF Aktiengesellschaft. Apparatus for texturizing filaments. 3,908,248, Cl. 28-1.400.
Schmidt, Arthur E., to Textron, Inc. Fluid cooled mirror. 3,909,118, Cl. 350-310.000.
Schmidt, John P.; and Garcia, Alfredo, Jr., to Halcon International, Inc. Purification of propylene oxide by distillation. 3,909,366, Cl. 203-69.000.
Schmidt, Peter; and Haberle, Karl-Heinz, to Eastman Kodak Company. Projection control circuit. 3,909,124, Cl. 353-86.000.
Schmidt, Reinhold, to GFE Gesellschaft fur Entstaubungstechnik AG. Dust extraction equipment for bulk material handling installations. 3,909,223, Cl. 55-467.000.
Schmitt, Jean-Claude Alphonse Henri: *See—*
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Schmutzler, Richard W.; Van Buren, Edgar S.; and Waldron, Gregory R., to Scott Machine Development Corporation. Keyboard operator sheet holding and feeding device. 3,908,297, Cl. 40-351.000.
Schneider, Charles, to Rhone-Poulenc S.A. Mouldable composition based on thermosetting resin. 3,909,475, Cl. 260-29.1SB.
Schnepp, James M., to Fiat-Allis Construction Machinery, Inc. Common drainage system and apparatus for engine oil sump and for oil filter of engine. 3,908,797, Cl. 184-1.500.
Schock, Paul Henry: *See—*
Bowman, Miles Augustus, Jr.; Hampton, Christopher James; and Schock, Paul Henry, 3,908,435.
Schoen, Lewis L.: *See—*
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Schon, Franz: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,909,196.
Schonstedt, Erick O., to Schonstedt Instrument Company. Magnetic locator having sensor units with two-piece housings and tubular cores. 3,909,704, Cl. 324-3.000.
Schonstedt Instrument Company: *See—*
Schonstedt, Erick O., 3,909,704.
Schottmiller, John C.; Ryan, Francis W.; and Wood, Charles, to Xerox Corporation. Photosensitive vitreous layer comprising bismuth and selenium. 3,909,458, Cl. 252-501.000.
Schreiber, August: *See—*
Angele, Eduard; Schreiber, August; and Seipp, Jurgen, 3,909,411.
Schreiber, Erich, to List, Hans. Device for the determination of liquid consumption. 3,908,450, Cl. 73-113.000.
Schrepferman, John R., to Bliss & Laughlin Ind., Inc. Nail and powered nailer. 3,908,884, Cl. 227-130.000.
Schroder, Wolfgang, to International Standard Electric Corporation. Electronic control utilizing odd or even counts. 3,909,732, Cl. 328-152.000.
Schroeder, David Lee: *See—*
Baum, Kurt; Baum, Joerg Peter; Pearce, Jai Kumar; and Schroeder, David Lee, 3,908,969.
Schroeder, Lloyd A. Model aircraft propulsion. 3,908,305, Cl. 46-74.00R.
Schroeder, Wilburn C. Removal of sulfur from carbonaceous fuels. 3,909,212, Cl. 44-1.00R.
Schulte, Donald L.: *See—*
Chang, Gregory I.; Buhrke, Rolfe E.; Schulte, Donald L.; and Wilber, John A., 3,909,795.
Schulte, Franz-Josef: *See—*
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Schultz, George E., to Tangen Drives, Inc. Feeder and drive track. 3,908,860, Cl. 221-161.000.
Schultz, Robert G.: *See—*
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Schulze, Wilhelm, to Maschinenbau Greene GmbH & Co., KG. Winding machines. 3,908,924, Cl. 242-56.00R.
Schumacher, Frank A., to General Electric Company. Dual control coordinating apparatus for a refrigerator. 3,908,392, Cl. 62-180.000.
Schurter, Gary Lee: *See—*
Bussen, Michael Robert; and Schurter, Gary Lee, 3,908,473.
Schutt, Klaus, to Cerberus AG. Ionization-type fire sensor. 3,908,957, Cl. 250-384.000.
Schuyf, Willem; Tent, Bart; Pattynama, Philip W.; and deKlerk, Frans, to Shell Oil Company. Method and means for controlling kicks during operations in a borehole penetrating subsurface formations. 3,908,769, Cl. 175-48.000.
Schwartz, Erving H. Putting aid. 3,908,991, Cl. 273-32.00R.
Schwarzkopf, Anton, to Anton Schwarzkopf, Firma. Self-propelled amusement-park rail vehicle. 3,908,554, Cl. 104-53.000.
Schweibold, Donald J.; and Bentley, David R., to Questor Corporation. Treatment of gaseous effluent. 3,908,365, Cl. 60-274.000.
Schwen, Roland; and Weber, Theodor, to BASF Aktiengesellschaft. Density measuring apparatus, with plurality of pivoted float indicators of differing buoyancies. 3,908,467, Cl. 73-454.000.
Scope Incorporated: *See—*
Drapeau, Raoul E., 3,908,800.
Scott, Gordon Robert. Windshield wiper savers. 3,908,222, Cl. 15-250.000.
Scott Machine Development Corporation: *See—*
Schmutzler, Richard W.; Van Buren, Edgar S.; and Waldron, Gregory R., 3,908,297.
Scott, Robert I. Roof truss fabrication apparatus. 3,908,885, Cl. 227-152.000.
Scully, Daniel F.: *See—*
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Sea Pines Company: *See—*
Payne, C. Lee, Jr.; and Gambello, Vincent J., 3,909,064.
Seaborn, Paul E., to Mead Corporation, The. Punching apparatus. 3,908,498, Cl. 83-210.000.
Sears, Roebuck & Company: *See—*
Stone, Thomas W.; and Benton, Stanley D., 3,909,589.
Sei, Makio: *See—*
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Seidl, Joachim: *See—*
Seidl, Maximilian R.; Seidl, Joachim; and Henry, Walton M., 3,908,544.
Seidl, Maximilian R.; Seidl, Joachim; and Henry, Walton M., to Avery Products Corporation. Label, ticket and tag printer with interchangeable tape supply and feeding magazine. 3,908,544, Cl. 101-292.000.
Seifert, Peter, to Black Clawson Company, The. Apparatus for fractionating fiber suspensions in accordance with fiber length. 3,909,400, Cl. 209-240.000.
Seip, Hermann, to ITT Industries, Inc. Brake force distributor. 3,909,074, Cl. 303-22.00R.
Seipos, Andrew G.: *See—*
Jureit, John Calvin; and Seipos, Andrew G., 3,908,850.
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Sekido, Satoshi; and Fukuda, Sadao, to Matsushita Electric Industrial Co., Ltd. Lead storage battery. 3,909,292, Cl. 136-27.000.
Sekine, Yoshikazu: *See—*
Tanaka, Yutaka; Shintani, Takamasa; Ogawara, Sumio; and Sekine, Yoshikazu, 3,909,514.
Selby, Donald W., to Du Pont de Nemours, E. I., and Company. Loader for pin elevator. 3,908,818, Cl. 198-161.000.
Selby, James L.; and Shirley, James N., to Top Quality Tool & Machine Co., Inc. Electrically powered self-propelled wheelchair and control unit. 3,909,689, Cl. 318-257.000.
Selden, Boynton, to Cushman Industries, Incorporated. Rotary chuck installation of fluid-actuated type. 3,908,383, Cl. 60-698.000.
Selle, James E.: *See—*
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Selley, Jeffrey E.: *See—*
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Seoka, Yoshio; Watarai, Syu; and Ono, Hisatake, to Fuji Photo Film Co., Ltd. Sensitizer for use in electrophotographic light-sensitive material. 3,909,260, Cl. 96-1.500.
Serio, John P.: *See—*
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Balasubramanian, K.; and Sexton, Joe F., 3,909,626.
Shaffer, Francis N.; Palumbo, Dominic T., deceased; and by Palumbo, Frances A., administratrix, to GTE Sylvania Incorporated. Calcium lithium silicate phosphors. 3,909,443, Cl. 252-301.40F.
Shah, Sunil Chunilal, to Cumberland Engineering Company, Inc. Method and apparatus for controlling noise producing equipment. 3,908,497, Cl. 83-169.000.
Shalit, Harold: *See—*
Rieve, Robert W.; and Shalit, Harold, 3,909,391.

Shapiro, Allen L.; Sherwood, Douglas T.; and Foster, Shelton A., to Omnus Computer Corporation. Minicomputer with selector channel input-output system and interrupt system. 3,909,790, Cl. 340-172.500.

Shapiro, Herbert D.; and Bondi, George A. Portable camera mounting apparatus. 3,908,945, Cl. 248-165.000.

Sharon, Uzi: *See*—
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Sharp Kabushiki Kaisha: *See*—
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Sheffler, Ralph W., to United States Steel Corporation. Crane trolley speed limiter. 3,908,939, Cl. 246-182.00R.

Shell, Bruce W.: *See*—
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van Holtz, Leopold C.; and Hop, Adrianus G., 3,908,897.

Shell, Robert L.: *See*—
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Shepherd, Stephan C., to Maxant Button & Supply Co. Tufting button. 3,908,236, Cl. 24-90.00B.

Sheppard, Walter R., Jr. Duct system for mobile home. 3,908,751, Cl. 165-27.000.

Sherrod, Eugene L. Pump for semi-fluid materials. 3,909,160, Cl. 417-517.000.

Sherwood, Douglas T.: *See*—
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Shibata, Akira; and Okamoto, Atutoshi, to Nippondenso Co., Ltd. Digitally controlled-operating system. 3,909,606, Cl. 235-153.00R.

Shields, Robert James, Jr.: *See*—
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Shigemori, Hideto: *See*—
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Shigeta, Tadao: *See*—
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Shiiki, Zenya: *See*—
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Shikaya, Yukihiro, to Dai Nippon Insatsu Kabushiki Kaisha. Method of making liquid-tight cup. 3,908,523, Cl. 93-36.010.

Shimada, Masaru: *See*—
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Shimadzu, Takahide: *See*—
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Shimizu, Isamu: *See*—
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Shimizu, Osamu, to Mutoh Industry Ltd. Drawing apparatus. 3,908,275, Cl. 33-75.00R.

Shimodaira, Toyohisa; Sato, Akio; and Kumagai, Ikuo, to Hitachi, Ltd. Electromagnetic brake. 3,908,802, Cl. 188-71.800.

Shimoyama, Takaitsu: *See*—
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Shoaf, George E. Building construction. 3,908,322, Cl. 52-90.000.

Shook, Gerald D., to Baltek Corporation. Machine for making contour-core blankets. 3,909,342, Cl. 156-522.000.

Shore, Paul B., to Shorewood Packaging Corporation. Record jacket making machine. 3,908,524, Cl. 93-62.000.

Shorewood Packaging Corporation: *See*—
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Short, Edward H., to Black, Sivalls & Bryson, Inc. Rupture disk assembly. 3,908,684, Cl. 137-68.000.

Shortt, Ronald F., to Jimmy Rails (U.S.A.) Inc. Passenger carrying assembly. 3,908,792, Cl. 182-37.000.

Shotmeyer, Albert. Device for removing water from the bottom of existing underground liquid fuel tanks. 3,908,690, Cl. 137-172.000.

Sibley, Henry C., to General Signal Corporation. Fail-safe logic circuitry for vehicle transportation control. 3,909,632, Cl. 307-241.000.

Siebel, Hans-Dieter; and Schlund, Hermann, to International Standard Electric Corporation. Arrangement for connecting exchange lines to switchboards in telephone systems. 3,909,546, Cl. 179-27.0FA.

Siegel, Sidney. Heating and cooling apparatus. 3,908,750, Cl. 165-26.000.

Siemens Aktiengesellschaft: *See*—
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Boroffka, Hartmut; Krimmel, Eberhard; and Runge, Hartmut, 3,909,305.
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Sien, Gerald Bruce, to Sien Equipment Company. Diesel tractor for articulated mine vehicles. 3,908,778, Cl. 180-77.0MC.

Signatron, Inc.: *See*—
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Signetics Corporation: *See*—
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Gauge, Thomas P.; Kocsis, Joseph; and Buchanan, James R., 3,909,320.

Signora, Maurizio, to Ing. C. Olivetti & C., S.p.A. U'fficio Brevetti. Apparatus for moulding helical parts by compacting powdered materials. 3,909,167, Cl. 425-78.000.

Signorino, Charles A.: *See*—
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Silverado Industries, Inc.: *See*—
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Simeth, Claus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Inking system with means for augmenting transferred ink. 3,908,545, Cl. 101-350.000.

Simon, Albert E., Jr.; and Rakocy, William J., to North American Philips Corporation. Drip coffee maker. 3,908,530, Cl. 99-307.000.

Simplimatic Engineering Co.: *See*—
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Kennedy, Francis M.; and Phillips, David, 3,908,339.

Singer, Barry M.: *See*—
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Singer Company, The: *See*—
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Herr, John A.; and Jaffe, Wolfgang, 3,909,645.
Ketterer, Stanley J., 3,908,569.
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Singh, Alamjit D. Waste disposal method and apparatus. 3,909,364, Cl. 201-2.500.

Sintokogio, Ltd.: *See*—
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Sivachenko, Eugene W. Method for salvaging scrap metal. 3,908,493, Cl. 83-23.000.

SKF Industrial Trading and Development Company, B.V.: *See*—
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Skimin, Carol W., to Kewanee Oil Co. Zinc electroplating baths and process. 3,909,374, Cl. 204-55.00R.

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Skolnick, Michael L.: *See*—
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Skreien, Nils, to Elkem Spigerverket A/S. Method for determining operating conditions in electrical furnaces. 3,909,242, Cl. 75-10.000.

Skrzelowski, David S., to Harbor Industries Incorporated. Display device. 3,908,830, Cl. 211-55.000.

Slavinsky, Nikolai Alexandrovich: *See*—
Asnis, Avraam Efimovich; Gretsky, Jury Yakovlevich; Kuznetsov, Evgeny Petrovich; Slavinsky, Nikolai Alexandrovich; and Melnichenko, Igor Mikhailovich, 3,909,253.

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Smith, Ernest D. Visual merchandiser for shirt and necktie. 3,908,823, Cl. 206-292.000.
Smith, Howard F., III, to Howard Smith Company. Method of making a deep well screen. 3,908,256, Cl. 29-163.5CW.
Smith, James R. Recirculating automotive heating system. 3,908,900, Cl. 237-12.30A.
Smith, James W., II: *See—*
Church, Clyde L.; and Smith, James W., II, 3,909,325.
Smith, Joseph L., Jr., to Massachusetts Institute of Technology. A-C powered, thyristor-switched electric motors having superconducting fields. 3,909,684, Cl. 318-138.000.
Smith, Richard E., to Xerox Corporation. Segmented gate developer flow controller. 3,908,596, Cl. 118-637.000.
Smolen, Benjamin Edward. Article for applying register or index marks and method of using the same. 3,909,329, Cl. 156-234.000.
Snam Progetti S.p.A.: *See—*
Rivola, Luigi; and Notari, Bruno, 3,909,439.
Snidar, Edward A.; Gaines, Donald R.; and Trudeau, William H., to Gulf & Western Manufacturing Company (Michigan). Ball joint construction. 3,909,084, Cl. 308-72.000.
Sno Pac Corporation: *See—*
Broman, Harold L., 3,908,540.
Sno-Trik Company: *See—*
Bedo, Alfred; and Beck, Edward, 3,908,463.
Snowden, Bryan T., to F.E.I., Inc. Plastic wheel construction for overhead conveyors. 3,909,066, Cl. 301-63.0PW.
Snyder, George D., to Chrysler Corporation. Vehicle gage alert system using light emitting diodes. 3,909,779, Cl. 340-52.00F.
Societe Anonyme des Etablissements Jouvenel & Cordier: *See—*
Debaye, Jean, 3,908,700.
Societe Anonyme dite: L'Oreal: *See—*
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S.A. Etablissements Francois Salomon & Fils: *See—*
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Salomon, Georges Pierre Joseph, 3,909,027.
Societe Anonyme Francaise du Ferodo: *See—*
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Societe Anonyme: Glaenzer Spicer: *See—*
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
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Societe de Vente de l'Aluminium Pechiney: *See—*
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Societe Francaise d'Instruments de Controle et d'Analyses: *See—*
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Societe Gamma Electronic: *See—*
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Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM): *See—*
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Societe Industrielle Gaillon-Armoryl "ARMOSIG": *See—*
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Societe Legris France S.A.: *See—*
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Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Lou, Wo Joaa; Volgyi, Paul; and Defossez, Roger, 3,908,243.
Soeno, Ko; Ando, Hisashi; and Sakamoto, Hiroshi, to Hitachi, Ltd. Self-restoring current limiter. 3,909,763, Cl. 337-21.000.
Sohm, Lawrence R., to Xerox Corporation. Control logic for changing a multi-mode copier/duplicator from one mode to another. 3,909,128, Cl. 355-8.000.
Sohngen, Edwin L., to Sybron Corporation. Film separator. 3,908,984, Cl. 271-113.000.
Solbeck, Erik. Apparatus for manufacturing a sheet material comprising a continuous web of a thermoplastics material with locally secured fastener elements. 3,909,340, Cl. 156-500.000.
Soleil, Daniel: *See—*
Nollace, Pierre; Soleil, Daniel; Chabane, Georges; and Bedrossian, Antoine, 3,909,621.
Solo, Alan J., to Knock-N-Lok International, Inc. Wood anchoring nail. 3,908,507, Cl. 85-30.000.
Solodar, Warren E.: *See—*
Mammino, Joseph; Jossel, Franklin; Kobey, James M.; Serio, John P.; Solodar, Warren E.; and Walker, Alan H., 3,909,259.
Soloviev, Oleg Pavlovich: *See—*
Tselikov, Alexandr Ivanovich; Zhukevich-Stosha, Evgeny Alexandrovich; and Soloviev, Oleg Pavlovich, 3,908,422.
Soltsien, Kay, to Siemens Aktiengesellschaft. Method of storing control data upon the interruption of a program in a processing system. 3,909,794, Cl. 340-172.500.
Sony Corporation: *See—*
Ohkoshi, Akio; Shiota, Takizo; and Kitamura, Nobuo, 3,909,524.
Sood, Vijay K.: *See—*
Robb, Raymond R.; Hewitt, Donald C.; Walter, Melvin G., Jr.; and Sood, Vijay K., 3,909,154.
Sorimachi, Kanehiro; Yamamichi, Masayoshi; Ito, Tadashi; and Nakamoto, Soichi, to Canon Kabushiki Kaisha. Exposure control system in single-lens reflex camera of the TTL metering type. 3,909,833, Cl. 354-29.000.
Southern Weaving Company: *See—*
Ross, Edgar A., 3,909,508.
Spatz Corporation: *See—*
Spatz, Walter B.; and Powers, Ronald J., 3,908,675.
Spatz, Walter B.; and Powers, Ronald J., to Spatz Corporation. Eyeshadow receptacle and applicator. 3,908,675, Cl. 132-82.00R.
Spears, Wayne. Emitter valve for subterranean irrigation systems. 3,908,694, Cl. 137-513.300.
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Spector, Richard: *See—*
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Spence, John R.; and Polkinghorn, Robert W., to Rockwell International Corporation. Protection circuit for MOS driver. 3,909,674, Cl. 317-16.000.
Spencer, Victor Vernon. Filter. 3,909,224, Cl. 55-482.000.
Speransky, Genrikh Alexandrovich: *See—*
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Furtado, Anthony E.; Wadsworth, Thomas H.; and Butler, L. Dennis, 3,908,833.
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Schloeman, Robert W., 3,908,934.
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Spiantini, Giancarlo; and Bardoni, Giacomo. Device for feeding material into work performing machines. 3,908,511, Cl. 91-44.000.
Spiecker, Karl-Heinz; Mudersbach, Wolfgang; and Michel, Rolf, to Demag Aktiengesellschaft. Coil winder cooling device. 3,908,424, Cl. 72-201.000.
Spielberg, David H.; Svacha, Roy E.; Janowski, Kenneth R.; and Hervert, George L., to Universal Oil Products Company. Oxygen sensor for automotive use. 3,909,385, Cl. 204-195.00S.
Spiessens, Roger, to N. V. Bekaert S.A. Method of joining wires, strands and cords. 3,908,715, Cl. 140-111.000.
Spiriti, Gaetano L.: *See—*
Richards, Glenn L.; and Spiriti, Gaetano L., 3,909,544.
Sporrer, Ludwig, to Siemens Aktiengesellschaft. Apparatus for doping semiconductor rods during floating zone melt processing thereof. 3,908,586, Cl. 118-49.100.
Spoth, James J.; and Robbins, Robert J., to Addressograph Multigraph Corporation. Start bit detector and data strober for asynchronous receiver. 3,909,724, Cl. 325-321.000.
Sprague Electric Company: *See—*
Dunkl, Franz S.; Ross, Sidney D.; and Finkelstein, Manuel, 3,909,682.
Springer, Donald A., to Plastics, Inc. Container for storing and carrying articles. 3,909,089, Cl. 312-138.00A.
Sproul, Nolte V.: *See—*
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Spurgeon, Larry L. Baseball batting practice apparatus. 3,908,990, Cl. 273-26.00E.
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Reed, Ronald H.; Drilling, Joseph C.; and Jones, Lary D., 3,909,098.
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Staats, Henry N., to General Binding Corporation. Clamp binding. 3,909,141, Cl. 402-19.000.
Staats, Robert Wallace: *See—*
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Stach, Kurt: *See—*
Reinhard, Ernst; Boy, Hans-Martin; Stach, Kurt; Kaiser, Fritz; and Lubs, Hans Joachim, 3,909,357.
Stachniak, Raymond M., to Zenith Radio Corporation. Layered, one-sided etched color selection electrode. 3,909,656, Cl. 313-402.000.
Stahl, William F., to Westinghouse Electric Corporation. Gas turbine having exhaust bearing support struts. 3,909,156, Cl. 415-142.000.
Stahle, Hermann, to Audi Nsu Auto Union Aktiengesellschaft; and Wankel, G.m.b.H. Housing for a rotary engine. 3,908,610, Cl. 123-8.010.
Staib, Helmut: *See—*
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Stamicarbon B.V.: *See—*
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Standard Brands Incorporated: *See—*
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Standard Oil Company: *See—*
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Standard Plastic Products, Inc.: *See—*
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Standex International Corporation: *See—*
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Staney, John W.: *See*—
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Stanford Research Insitute: *See*—
Hendry, Dale G.; Hill, Marion E.; and Peters, Howard M., 3,909,497.
Stanley, William L.; and Watters, Glenn G., to United States of America, Agriculture. Insolubilized enzymes. 3,909,358, Cl. 195-63.000.
Stanley Works, The: *See*—
Plaw, Graeme Raymond, 3,908,487.
Rutty, Edward Charles, 3,908,277.
Stansbury, Benjamin H., Jr.: *See*—
Sargent, Ronald J.; Vanden Broek, Christiaan J. H.; Henke, Arthur W.; Andersen, James M.; Stansbury, Benjamin H., Jr.; Kaminski, Stephen H.; and Mayer, Edward, 3,908,202.
Stanton, Samuel S.: *See*—
Getchell, Nelson F.; Hollies, Norman R. S.; and Stanton, Samuel S., 3,908,408.
Stark, Heinz, to Demag Aktiengesellschaft. Closed reduction furnace. 3,909,499, Cl. 13-35.000.
Stark, Marvin L.: *See*—
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Stauffer Chemical Company: *See*—
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Ferre, Salvador; Lotan, Dan; Morbioli, Rene Jean; Schmitt, Jean-Claude Alphonse Henri; and Cordazzo, Jean-Louis, 3,909,652.
Stearns, Richard S.; and Thompson, Robert M., to Sun Ventures, Inc. Preparation of improved motor fuels containing furan antiknocks. 3,909,216, Cl. 44-63.000.
Stefansson, Rafn: *See*—
Raymond, William R.; and Stefansson, Rafn, 3,909,784.
Steffan, Walter J. Sighting in apparatus for rifle mounted telescope gunsights. 3,908,282, Cl. 33-234.000.
Steiger, Anton, to Sulzer Brothers Limited. Hydrostatic transmission. 3,908,376, Cl. 60-428.000.
Stein, Dieter: *See*—
Rose, Fritz; Bechthold, Horst; Bieniok, Paul; and Stein, Dieter, 3,909,244.
Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Process for the production of a two-phase charge shift arrangement for charge coupled devices. 3,908,262, Cl. 29-579.000.
Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Process for compensating boundary charges in silicon thin layers epitaxially grown on a substrate. 3,909,307, Cl. 148-1.500.
Steinberg, George N.: *See*—
Huchital, David A.; and Steinberg, George N., 3,909,736.
Steiner, David C.: *See*—
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Steiner, Edward L.: *See*—
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Steinmaier, Walter: *See*—
Le Can, Claude Jan Principe Frederic; Kooi, Else; and Steinmaier, Walter, 3,909,318.
Stella, Joseph A., to Polaroid Corporation. Electromagnetic and electrostatic recording shield. 3,909,120, Cl. 352-29.000.
Stemmle, Denis J., to Xerox Corporation. Binless sorting apparatus. 3,908,978, Cl. 270-58.000.
Stenner, Eric John. Rotary pumps or engines of the sliding, rocking, abutment type. 3,909,161, Cl. 418-6.000.
Stetson, Ralph B.: *See*—
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Steup, Herbert: *See*—
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Stewart, Ben A., to Olin Corporation. Safety device with coanda effect. 3,909,037, Cl. 280-150.0AB.
Stiron Chemical Industry Co. Ltd.: *See*—
Ono, Tasuku, 3,908,505.
Stoffel, John F., to Stoffel Seals Corporation. Key holder. 3,908,418, Cl. 70-456.00R.
Stoffel Seals Corporation: *See*—
Stoffel, John F., 3,908,418.
Stone, Carl A.; Imes, Robert H.; Murphy, Peter C.; and Thompson, Robert D., to P. R. Mallory & Co., Inc. Disposable resistance welding electrode. 3,909,581, Cl. 219-120.000.
Stone Industrial Corporation: *See*—
Loyd, Patrick V.; and Mills, Samuel M., 3,908,267.
Stone, Kirby Lee: *See*—
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Stone, Richard L. Detachable boat boarding device. 3,908,794, Cl. 182-91.000.
Stone, Thomas W.; and Benton, Stanley D., to Ventrola Manufacturing Company; and Sears, Roebuck & Company. Modular heating, lighting and ventilating unit. 3,909,589, Cl. 219-361.000.
Stone, Wayne B., Jr. Method and apparatus for converting liquid shock waves into rotary motion. 3,908,382, Cl. 60-649.000.
Stoody Company: *See*—
Kuttner, Ralph, 3,908,747.
Stotts, Larry B., to United States of America, Navy. Optical coupler. 3,909,113, Cl. 350-160.0LC.
Stotz, Wolf-Gunter; and Hildebrand, Otto, to Escher Wyss GmbH. Pulp feed for a paper making machine. 3,909,349, Cl. 162-317.000.
Stout, Robert K. Void creating device to be embedded in a concrete structure. 3,908,323, Cl. 52-99.000.
Stout, Robert K. Concrete structure including modular concrete beam and method of making same. 3,908,324, Cl. 52-100.000.
Strader, James W. Fishing lure. 3,908,298, Cl. 43-42.050.
Stradler Ship Company: *See*—
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Stretch Devices, Inc.: *See*—
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Strickland, Daniel M., to United States of America, Air Force. Split-ring marx generator grading. 3,909,624, Cl. 307-110.000.
Stritzko, Vilem, to Bleiche A.G. Method and apparatus for regulating the tension of a moving threadlike element. 3,908,929, Cl. 242-150.000.
Strocker, Gunter, to Gustav Schade Maschinenfabrik. Removal of material from bulk storage. 3,908,837, Cl. 214-10.000.
Stromberg-Carlson Corporation: *See*—
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Strong Enterprises, Inc.: *See*—
Poynter, Daniel F., 3,908,937.
Strubin, Harald, to BBC Brown Boveri & Company Limited. Explosion gas operated piston-cylinder structure. 3,908,512, Cl. 91-357.000.
Struyk, Richard. Land and water transport. 3,908,577, Cl. 115-1.00R.
Stryczek, Leon K. Automatic filling ruling pen. 3,909,140, Cl. 401-233.000.
Stuart, Richard L., to Rixon, Inc. Carrier phase correction circuit for data communications system. 3,909,752, Cl. 333-18.000.
Stuhmer, Rolfherbert. Sledding system. 3,908,556, Cl. 104-134.000.
Sugimura, Shigeo: *See*—
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Sugita, Osamu: *See*—
Matsuda, Hirotoshi; Sugita, Osamu; and Inoue, Yuji, 3,909,620.
Sugiura, Naokatsu, to Sansui Electric Co., Ltd. Self-exciting direct current motors. 3,909,690, Cl. 318-138.000.
Sukenik, Robert J., to New Hudson Corporation. Safety system for pressurized vessels. 3,908,755, Cl. 165-89.000.
Sulcs, Juris; Jennings, David L.; and Garrick, George R., to General Electric Company. Metal halide discharge lamp starting electrode. 3,909,660, Cl. 315-60.000.
Sullivan, Frank E. System for determining processing losses or gains. 3,909,596, Cl. 235-92.0PD.
Sulzer Brothers Limited: *See*—
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Sumitani, Hideo: *See*—
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Sumitomo Electric Industries, Ltd.: *See*—
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Sumiyoshi, Masaharu: *See*—
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Sundahl, Edwin G., to United States of America, Energy Research and Development Administration. Calibration block. 3,908,278, Cl. 33-168.00R.
Sundstrand Syracuse, Inc.: *See*—
Schaller, Robert L., 3,908,315.
Surr, Eric Thornton, to CCL Systems Limited. Coupling assembly for stressing tendons of multi-span concrete structures. 3,909,142, Cl. 403-41.000.
Suter, Hans-Jorg, to Contraves AG. Apparatus for generating a synchronization voltage for the ignition pulse control of controlled rectifier-power stages. 3,909,728, Cl. 328-28.000.
Sutton, Ernest S., Jr.; Pacanowsky, Eugene J.; and Reed, Donald R., to Thiokol Corporation. Variable flow gas generating method and system. 3,908,358, Cl. 60-39.030.
Suzuki, Gyoichi: *See*—
Miyashita, Isuneo; Ozeki, Shoichiro; Nishio, Hiroaki; Nayuki, Tosio; Kobayashi, Tadashi; Suzuki, Gyoichi; and Murakami, Tadashi, 3,909,446.
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Suzuki, Takeo; and Ito, Seiga, to Kyowa Hakko Kogyo Co., Ltd. Production of fatty acid esters of fructose. 3,909,356, Cl. 195-47.000.
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Swanson, Elston H., to Instruments for Industry. Wide band grid circuit coaxial tube. 3,909,658, Cl. 315-39.000.
Swanson, Harold V.; and Bald, Robert E., to Interpace Corporation. Corrosion protective collar for underground pipe joints with metal parts. 3,909,010, Cl. 277-1.000.
Swenson, Richard E. Collapsible hand saw. 3,908,726, Cl. 145-33.00E.
Sybron Corporation: *See—*
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Szydlowski, Joseph. Bypass turbojet with variable pitch low pressure compressor for thermal load control. 3,908,362, Cl. 60-226.00R.
Tada, Ritsuro: *See—*
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Taguchi, Eiji; Nakano, Soichi; and Iizuka, Yoshitoku, to Honda Giken Kogyo Kabushiki Kaisha. Intake and exhaust system for internal combustion engine. 3,908,619, Cl. 123-122.0AB.
Takacs, Edward Andrew, to American Cyanamid Company. Process for the odor removal of malodorous sulfur containing olefinic derivatives. 3,909,395, Cl. 208-196.000.
Takada, Haruo: *See—*
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Takagi, Izumi; and Adachi, Shigeo, to Kawasaki Jukogyo Kabushiki Kaisha. Centrifugally controlled expansible pulley with torque cam actuation. 3,908,475, Cl. 74-230.17E.
Takahara, Ichiro; Yabu, Tadahiko; and Miwa, Takashi, to Sanyo Electric Co., Ltd. Record protective jacket. 3,908,824, Cl. 206-312.000.
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, to Nissan Motor Company Limited. Constant velocity universal joint. 3,908,400, Cl. 64-21.000.
Takahashi, Koichi; Hayashi, Tadashi; Kakei, Jun; and Narusawa, Ikuo, to Nissan Motor Company Limited. Vehicular rear viewing device. 3,909,117, Cl. 350-302.000.
Takahashi, Masaaki, to n a c Incorporated. Multi-color data processing method. 3,909,840, Cl. 358-81.000.
Takahashi, Naoki: *See—*
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Takahashi, Shoji; and Yabe, Toshinori, to Bridgestone Tire Company Limited. Apparatus for successively supplying endless tire bands to a tire carcass producing equipment. 3,909,336, Cl. 156-405.000.
Takai, Akira: *See—*
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Takaoka, Michio; Oshima, Hiroto; Katsuhara, Toshiharu; Ono, Motoyuki; Sano, Hideo; Seki, Masaichiro; and Hasegawa, Masakazu, to Fujikura Cable Works, Ltd., The. Apparatus for manufacturing polyolefin-insulated cables. 3,909,177, Cl. 425-384.000.
Takata, Harry H., to Raygo, Inc. Variable amplitude vibration generator. 3,909,147, Cl. 404-117.000.
Takeda Chemical Industries, Ltd.: *See—*
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Matsui, Yutaka; Kazama, Seiji; Nakabayashi, Masamitsu; and Kobayashi, Koji, 3,909,466.
Takeda, Hitoshi: *See—*
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Takeshima, Takaoki: *See—*
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Tamai, Yasuo; Takimoto, Masaaki; Nahara, Akira; and Sato, Masamichi, to Rank Xerox Ltd. Laser recording method. 3,909,254, Cl. 96-1.00R.
Tamura Electric Works, Ltd.: *See—*
Nishina, Rintaro, 3,909,820.
Tanaka, Kenjiro; Shigeta, Tadao; Kikkawa, Nobuyuki; Kumura, Noriharu; and Ono, Katsuhiro, to Idemitsu Kosan Company Ltd. Method of producing decomposable resin moldings. 3,909,468, Cl. 260-8.000.
Tanaka, Yukiyasu: *See—*
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Tanaka, Yutaka; and Ogawara, Sumio, to Matsushita Electric Industrial Co., Ltd.; and Matsushita Graphic Communication Systems, Inc. Facsimile system. 3,909,513, Cl. 178-6.000.
Tanaka, Yutaka; Shintani, Takamasa; Ogawara, Sumio; and Sekine, Yoshikazu, to Matsushita Electric Industrial Co., Ltd.; and Matsushita Graphic Communication System, Inc. Facsimile communication system. 3,909,514, Cl. 178-6.000.
Tang, Raymond; Burns, Richard W.; and Holden, Russell L., to Hughes Aircraft Company. Microwave switch and shifter including a bistate capacitor. 3,909,751, Cl. 333-7.00D.
Tange, Shoji; and Nakai, Meroji, to Nissan Motor Company Limited. Torch-ignition reciprocating-piston type internal combustion engine. 3,908,618, Cl. 123-119.00A.
Tangen Drives, Inc.: *See—*
Schultz, George E., 3,908,860.
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Tantillo, Alfred V., to General Bathroom Products Corporation. Means for temporarily hanging a cabinet on a wall surface prior to permanent attachment of said cabinet. 3,909,091, Cl. 312-224.000.
Tarridec, Andre; and Joubert, Jean Leon Marie. Multifrequency signalling device and particularly signalling receiver thereof. 3,909,549, Cl. 179-84.0VF.
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Taunton, James Hugh. Shallow water breathing apparatus. 3,908,647, Cl. 128-145.00A.
Taylor, Chester E. Self straining animal litter box. 3,908,597, Cl. 119-1.000.
Taylor, Henry F., to United States of America, Navy. Optical switch and modulator. 3,909,108, Cl. 350-96.0WG.
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Taylor, Michael Geoffrey Cleeve, to GTE International Incorporated. Electronic hybrid. 3,909,559, Cl. 179-170.0NC.
Taylor, Philip W., to Taylor Industries Inc. Modular electrical component mounting assembly with integral wiring duct. 3,909,505, Cl. 174-72.00A.
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Teeters, Lloyd L. Flame and carbon monoxide sensor and alarm circuit. 3,909,816, Cl. 340-237.00R.
Tekonsha Engineering Company: *See—*
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Telliard, Gregory Alan; Hamilton, David Michael; and Chaplin, Gary , Edward. Removable snap fastener. 3,908,235, Cl. 24-73.00P.
Tenen, Stanley N. Ballast circuit for gaseous discharge lamps. 3,909,666, Cl. 315-200.00R.
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Teraishi, Katsuhiro; and Yamada, Kuniharu, to Kabushiki Kaisha Suwa Seikosha. Variable ceramic capacitor for an electronic wristwatch. 3,909,638, Cl. 310-8.100.
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Thomas, Friedrich Werner; and Vock, Gerhard, to Leybold-Heraeus-Verwaltung G.m.b.H. Arrangement for regulating the operating parameters of an electron beam generator. 3,909,662, Cl. 315-106.000.
Thomas, Friedrich Werner; and Vock, Gerhard, to Leybold-Heraeus-Verwaltung G.m.b.H. Arrangement for regulating the operating parameters of an electron beam generator. 3,909,663, Cl. 315-106.000.
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Thompson, Herbert H., to United States of America, Army. Method and apparatus for cable sensitizing. 3,908,254, Cl. 29-25.350.
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Tokura, Yasufumi; Matsuno, Kazuo; and Sakurai, Itaru, to Toyoda Koki Kabushiki Kaisha. Program control device. 3,909,801, Cl. 340-172.500.
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Traub, Henry A.; and Gauley, Isiah Sherman, to W. S. Shamban & Co. Seal assembly with pivotable slipper seal. 3,909,016, Cl. 277-165.000.
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Trubiano, Antoine. Hook means for shopping cart. 3,909,034, Cl. 280-47.340.
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Tschopp, Werner, to Messrs. Spectrospin AG. Method of and device for recording spin resonance spectra. 3,909,705, Cl. 324-.50R.
Tselikov, Alexandr Ivanovich; Zhukevich-Stosha, Evgeny Alexandrovich; and Soloviev, Oleg Pavlovich. Planetary rolling mill. 3,908,422, Cl. 72-190.000.
Tsubaki, Tohru; Nakano, Seizo; and Sato, Minoru, to Hitachi, Ltd. Circuit breaking section of a gas circuit breaker of the puffer type. 3,909,572, Cl. 200-148.00A.
Tsuchida, Takayasu; Matsui, Hiroshi; Enei, Hitoshi; and Yoshinaga, Fumihiro, to Ajinomoto Co., Inc. Method of producing L-phenylalanine by fermentation. 3,909,353, Cl. 195-29.000.
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Vahle, Klaus-Heinrich, to Eisenwerk Weserhutte A.G. Unitary heat-sensitive structures. 3,909,083, Cl. 308-20.000.

Vail, Sidney L., to United States of America, Agriculture. Catalyst assist agents using leaving group effects. 3,909,199, Cl. 8-181.000.

Vald. Henriksen A/S: *See—*
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Valeriano, Anthony J. Apparatus for dispensing a fluid in a conduit interior. 3,908,799, Cl. 184-38.00R.

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van den Berg, Jan Wouter, to International Business Machines Corporation. Selectively settable frequency divider. 3,909,791, Cl. 340-172.500.

Vanden Broek, Christiaan J. H.: *See—*
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van den Broek, William A., to KDI Sylvan Pools, Inc. Recirculating water supply system for swimming pools. 3,908,207, Cl. 4-172.170.

Van der Gaag, Cornelis, to N.V. Industrieele Handelscombinatie Holland. Floating mooring arrangement. 3,908,576, Cl. 114-230.000.

van der Meulen, Andries, to U.S. Philips Corporation. Apparatus for automatically adjusting the operation time of an irradiation device. 3,909,659, Cl. 315-56.000.

van de Rovaart, Paul; and Van De Rovaart, Paul, to Societe d'Assistance Technique pour Produits Nestle S.A. Extrusion nozzle. 3,909,181, Cl. 425-461.000.

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Van Der Stricht, Pablo M. Cable-suspension device for apparatus to be protected from impacts. 3,908,940, Cl. 248-18.000.

Vane, Rodney D. Film pack for microfiche camera. 3,909,836, Cl. 354-276.000.

Van Engeland, Jozef Leonard: *See—*
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Van Fossen, Frederick L., to International Harvester Company. Transfer case assembly with a double duty differential. 3,908,775, Cl. 180-44.00R.

van Heijst, Willem Jan, to N.V. Industrieele Handelscombinatie Holland. Buoy with associated mooring arrangement. 3,908,212, Cl. 9-8.00P.

van Holtz, Leopold C.; and Hop, Adrianus G., to Shell Oil Company. Off-line integration of bridge and boiler controls. 3,908,897, Cl. 236-14.000.

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Van Mullekom, Hubert Peter, to N. V. Machinefabriek L. Te Strake. Weaving machine. 3,908,710, Cl. 139-194.000.

Van Rens, Russell J., to Outboard Marine Corporation. Apparatus for eliminating drains in a rotary combustion engine. 3,908,607, Cl. 123-8.010.

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Vaughen, Jack F. Air cushion conveyances. 3,908,785, Cl. 180-127.000.

Vaughn, John Edward; and Dixon, William Bradley, to Chicago Bridge & Iron Company. Adjustable metal scaffold. 3,908,793, Cl. 182-82.000.

Vause, Arthur Samuel; and Woodward, Frank, to Thorn Electrical Industries Limited. Sealed-beam lamp construction. 3,909,607, Cl. 240-41.0BM.

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Vella, Tony J. Putter having circular level. 3,909,004, Cl. 273-162.00B.

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Verbeke, Henry. Packaging machine. 3,909,334, Cl. 156-378.000.

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Verdon, David Charles; and Woodhouse, Victor, to British Steel Corporation. Ultrasonic transducer with coupling means. 3,908,445, Cl. 73-71.5US.

Vereinigte Flugtechnische Werke-Fokker GmbH: *See—*
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Viek, Nicholas F. Simplified catheter. 3,908,635, Cl. 128-2.00M.

Viek, Nicholas F. Catheter. 3,908,663, Cl. 128-349.00R.

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Visser, Peter J., to Clark Equipment Company. Outrigger. 3,909,040, Cl. 280-150.500.

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Vitt, Theodor, to Prameta Prazisionsmetall und Kunststofferzeugnisse G. Baumann & Co. Lockable furniture hinge. 3,908,224, Cl. 16-164.000.

Vjecsner, Paul. Corner lock for paperboard containers. 3,908,889, Cl. 229-35.000.

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Wagner, Heinz, to Siemens Aktiengesellschaft. Supply device for supply conductors of high frequency equipment and the like. 3,909,623, Cl. 307-93.000.
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Watanabe, Susumu; Sato, Hiromu; Fuma, Toyoji; and Takeda, Hitoshi, to Sintokogio, Ltd. Blasting device for cleaning relatively large surfaces. 3,908,314, Cl. 51-9.00M.
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White, Dana. Collapsible tube dispenser. 3,908,863, Cl. 222-103.000.
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Williams, Chester I. Rock bolt for remote installation. 3,908,386, Cl. 61-35.000.
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Williams, Melvin. Automatic serum preparation station. 3,908,893, Cl. 233-20.00R.
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Wirstlin, Arthur N.; and Forlenza, David N., to Fawn Engineering Corporation. Partitioning apparatus for vending machine helix discharge units. 3,908,858, Cl. 221-75.000.
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Wiseman, Raymond L. Method and means for stacking articles. 3,908,985, Cl. 271-189.000.
Wisner, George R.; Mapes, Stuart N.; and Skolnick, Michael L., to United Technologies Corporation. Unstable resonator system producing a high irradiance beam in the far field. 3,909,744, Cl. 331-94.50C.
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Wolf, Tobin. Remote control toy. 3,909,276, Cl. 46-244.00R.
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Wolfe, Denis G.; and Tyler, Hugh J., to Robertshaw Controls Company. Fluid pressure responsive device. 3,908,378, Cl. 60-527.000.
Wolley, Elden D., to Westinghouse Electric Corporation. Guarded planar PN junction semiconductor device. 3,909,119, Cl. 357-13.000.
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Wood, George P., to United States of America, Navy. Method and means for inspecting bore surfaces in elongate articles. 3,909,139, Cl. 356-241.000.
Wood, Robert Arthur Ray, to Teleflex Incorporated. Marine steering control valve and system. 3,908,687, Cl. 137-106.000.
Wood, Wilburn W. Typewriter signal device for indicating last line to be typed. 3,908,820, Cl. 197-189.000.
Woodhouse, Victor: *See*—
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Woznicki, Edward J.; and Signorino, Charles A., to Colorcon Incorporated. Lake process. 3,909,284, Cl. 106-289.000.
Wray, William R., to Polaroid Corporation. Analog information storage and retrieval system. 3,909,843, Cl. 360-27.000.
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Wright, Hershel Earl. Hair conditioning device. 3,908,679, Cl. 132-116.000.
Wright, Howard J.; and Van Horn, Charles R., to Cook Paint & Varnish Company. Acrylic dispersions containing only nonfunctional groups. 3,909,479, Cl. 260-33.6UA.
Wuertemburg, Charles W.; and Dworkin, Darryl R., to Standard Plastic Products, Inc. Practice putting device including balanced, inverted trapping-rimming cup. 3,909,007, Cl. 273-177.00A.
Wulke, William L.; and Rabska, Reinhart J. Portable ice cube maker. 3,908,391, Cl. 62-137.000.

Wunluck, Bruce R.; Draayer, Johannes; Young, John S.; Van Bosse, John G.; and Douglas, Robert P., to GTE Automatic Electric Laboratories Incorporated. Trunk circuit control arrangement for a communication switching system. 3,909,542, Cl. 179-18.0AH.
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Ylinen, Laurie L. Flail device and lawn cleaning and packing apparatus. 3,909,220, Cl. 55-296.000.
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Yokota, Hiroshi; and Machida, Humimasa, to Tokyo Shibaura Electric Co., Ltd. Control circuit for a condenser discharge type welder. 3,909,694, Cl. 320-1.000.
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Young, Cecil G., to Muskin Corporation. Anti-siphon valve for swimming pool lint pot. 3,909,415, Cl. 210-234.000.
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Zimmerman, Thomas C.; and Michels, Charles E., to Robert Bosch G.m.b.H. Film tucking apparatus. 3,908,337, Cl. 53-206.000.

Zoor, Reinhold, to Heinrich Wunder, KG. Safety ski binding. 3,909,023, Cl. 280-11.35T.

Zuber, Guenter, to Carl Schenck AG, Firma. Clamping device, especially for material testing machines. 3,908,449, Cl. 73-103.000.

Zuckerman, Walter. Telephone coupler unit. 3,909,535, Cl. 179-2.00C.

Zullig, Heinz, to MADAG Maschinen-und Apparatebau Dietikon AG. Hand-operated knitting machine. 3,908,404, Cl. 66-60.000.

Zurek, James W.; and Fulghum, David A., to International Harvester Company. Self actuating mechanism for braking a driven member upon discontinuation of drive thereto. 3,908,344, Cl. 56-11.300.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF SEPTEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bell Telephone Laboratories, Incorporated: *See*—
Fleischer, Paul Egon, Re. 28,565.

Ekenberg, Christer U.: *See*—
Holst, Jan-Olov M.; Nordstrom, Rolf E.; and Ekenberg, Christer U., Re. 28,562.

Fleischer, Paul Egon, to Bell Telephone Laboratories, Incorporated. Adjustable active equalizer. Re. 28,565, Cl. 330-107.000.

Fling, John J., to Sigma Engineering Company. Diaphragm ear valve. Re. 28,560, Cl. 128-152.000.

Holst, Jan-Olov M.; Nordstrom, Rolf E.; and Ekenberg, Christer U. Brake control for preventing locking during the braking of a rotating wheel. Re. 28,562, Cl. 303-61.000.

Inoue, Kiyoshi. Electrochemical machining apparatus and method. Re. 28,564, Cl. 204-129.200.

Mitchell, James G.: *See*—
Mitchell, Winalee G.; and Mitchell, James G., Re. 28,563.

Mitchell, Winalee G.; and Mitchell, James G. Method for fabrication of plastic footwear. Re. 28,563, Cl. 156-252.000.

Nordstrom, Rolf E.: *See*—
Holst, Jan-Olov M.; Nordstrom, Rolf E.; and Ekenberg, Christer U., Re. 28,562.

Palmer Filter Equipment Co.: *See*—
Stephens, Leonard W., Re. 28,561.

Sigma Engineering Company: *See*—
Fling, John J., Re. 28,560.

Stephens, Leonard W., to Palmer Filter Equipment Co. Reversible one-way clutch. Re. 28,561, Cl. 192-44.000.

Villano, John A. Method for milling cams for Swiss-type screw machines. Re. 28,559, Cl. 90-11.00C.

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Abbott Laboratories: *See*—
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Achenbach, Walter B., to Owens-Illinois, Inc. Canister or similar article. 236,936, 9–30–75, Cl. D7—79.

Akel, Fred A. Golf ball washer or the like. 237,005, 9–30–75, Cl. D49—11.

Amerace Corp.: *See*—
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Amerock Corp.: *See*—
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Batke, Gerhard W., Anderson, and Thompson. 236,991.

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B.A.R.T.E.R. (H.K.) Ltd.: *See*—
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Batke, Gerhard W., I. A. Anderson, and J. W. K. Thompson, to General Signal Corp. Front plate for a telephone station. 236,991, 9–30–75, Cl. D26—14.

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Armstrong, Albert, Bauman, Di Lena, Eisen, Jamieson, Palluzi, and Rukin. 236,968.

Baumann, Frederick W., to General Electric Co. Dynamoelectric machine. 236,985, 9–30–75, Cl. D26—5.

Baxter Laboratories, Inc.: *See*—
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Betka, Harold A., and A. F. Bujan, to Abbott Laboratories. Flexible container for medical fluids. 237,018, 9–30–75, Cl. D83—1.

Bierbusse, James H., and J. F. Newman, to Uniroyal, Inc. Pneumatic tire thread and buttress. 236,970, 9–30–75, Cl. D12—151.

Bierbusse, James H., A. C. Blankenship, and R. F. Busch, to Uniroyal, Inc. Pneumatic tire tread and buttress. 236,972, 9–30–75, Cl. D12—151.

Blake, Gerald L., and M. Ferar. Laundry agitator or similar article. 237,004, 9–30–75, Cl. D49—1.

Blankenship, Arthur C.: *See*—
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Blankenship, Arthur C., and L. J. Mysliwiec, to Uniroyal, Inc. Pneumatic tire tread and buttress. 236,969, 9–30–75, Cl. D12—142.

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Bowen, Henry E., Jr. Funnel for directing yard debris into a bag or similar article. 236,938, 9–30–75, Cl. D7—189.

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Brady, Rupert J., to Walter Kidde & Co., Inc. Boom section for a crane boom. 236,965, 9–30–75, Cl. D12—60.

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Burton, Edward E. Utility rack for trucks. 236,973, 9–30–75, Cl. D12—157.

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Cade, Samar E. Guitar body. 237,008, 9–30–75, Cl. D56—1.

Callahan, Francis J., Jr., B. J. Gallagher, U. H. Koch, and S. Matousek, to Whitey Research Tool Co. Housing for fluid system control or modifying device. 236,980, 9–30–75, Cl. D23—38.

Cannon, Max C. Mausoleum. 236,976, 9–30–75, Cl. D13—1.

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Davis, Howard C. Chess board or the like. 236,993, 9–30–75, Cl. D34—5.

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Gandini, Sergio. Floor lamp. 237,002, 9–30–75, Cl. D48—20.

Gardenhour, Eugene C., and H. S. Robins, to Walter Kidde & Co., Inc. Boom section for a telescope. 236,966, 9–30–75, Cl. D12—60.

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Gnutzman, Keith L., and E. P. Hess, to Xerox Corp. Combined ribbon and cartridge therefor. 237,010, 9–30–75, Cl. D64—11.

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Gray, Eugene B. Coin dispenser. 237,006, 9–30–75, Cl. D52—4.

Gutowski, Antoni P., and R. F. West, to The Stanley Works. Plumb bob. 236,957, 9–30–75, Cl. D10—61.

Harris, James F. Motorcycle glove compartment. 236,974, 9–30–75, Cl. D12—158.

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Holman, Howard E., to Matsushita Electric Industrial Co. Ltd. Speaker cabinet. 236,989, 9–30–75, Cl. D26—14.

Huntley, James R. Jig for making picture frames. 236,940, 9–30–75, Cl. D8—72.

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Janhanddeh, Barbara N. Electric light. 237,003, 9–30–75, Cl. D48—20.

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Lewis, Peter H., to B.A.R.T.E.R. (H.K.) Ltd. Combined radio transmitter and receiver. 236,990, 9–30–75, Cl. D26—14.

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MacLaren, David S. Aerator for a sewage system. 237,007, 9–30–75, Cl. D55—1.

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Mori, Shinjiro, to Mori Denki Mfg. Co., Ltd. Receptacle cover plate. 236,949, 9–30–75, Cl. D8—184.

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Penn-Plax Plastics, Inc.: *See*—
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Armstrong, Albert, Bauman, Di Lena, Eisen, Jamieson, Palluzi, and Rukin. 236,968.

Russo, Ronald D., to King-Seeley Thermos Co. Insulated bottle with attached cup. 236,937, 9–30–75, Cl. D7—77.

Seaveras, Robert G., to Baxter Laboratories, Inc. Clamp. 236,941, 9–30–75, Cl. D8—73.

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Steinhart, Siegfried. Chain candle. 237,012, 9–30–75, Cl. D73—1.

Steinhart, Siegfried. Chain candle. 237,013, 9–30–75, Cl. D73—1.

Steinhart, Siegfried. Chain candle. 237,014, 9–30–75, Cl. D73—1.

Steinhart, Siegfried. Chain candle. 237,015, 9–30–75, Cl. D73—1.

Stevenson, Charles F., to Rinn Corp. X-ray collimating extension tube positioning ring for posterior type dental X-ray film holders. 237,016, 9–30–75, Cl. D83—1.

Stirling, Loren D., to Xerox Corp. Paper handling stand. 236,924, 9–30–75, Cl. D6—85.

Stroberg, Rolf, and B. Ljunglof. Submersible pump. 237,011, 9–30–75, Cl. D65—1.

Summers, Marion K. Clock face. 236,962, 9–30–75, Cl. D10—125.

Telex Communications, Inc.: *See*—
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Tongson, Kenneth Y., to Star Industrial Co., Ltd. Lamp shade. 236,999, 9–30–75, Cl. D48—16.
Tongson, Kenneth Y., to Star Industrial Co., Ltd. Lamp shade. 237,000, 9–30–75, Cl. D48—16.
Turner, Allen D., to Uniroyal, Inc. Pneumatic tire tread and buttress. 236,971, 9–30–75, Cl. D12—151.
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Valentine, Charles G., to Xerox Corp. Educational measuring device board. 236,979, 9–30–75, Cl. D19—62.
Valentine, Charles G., to Xerox Corp. Combined support and storage tray for an educational kit or similar article. 237,020, 9–30–75, Cl. D87—1.
Von Serda, Bozidar M. Lamp shade. 237,001, 9–30–75, Cl. D48—16.
Walters, Warren R., and M. P. Carpenter, to Telex Communications, Inc. Headphone earpiece. 236,988, 9–30–75, Cl. D26—14.
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Winslow, Donald L., to The J. M. Ney Co. Door for vacuum furnace. 236,981, 9–30–75, Cl. D23—82.
Wooding, Robert L., to Robertshaw Controls Co. Control panel for clock and timer. 236,954, 9–30–75, Cl. D10—2.
Wright, Donald E. Level instrument. 236,959, 9–30–75, Cl. D10—69.
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426 3,908,535
472 3,908,536
3,908,537

CLASS 100
35 3,908,808
49 3,908,538
3,908,539
215 3,908,540
3,908,541

CLASS 101
79 3,908,542
110 3,908,543
292 3,908,544
350 3,908,545
378 3,908,546
465 3,908,547

CLASS 102
13 3,908,548
27R 3,908,549
37.4 3,908,550

70.2G 3,908,551
70.2P 3,908,552
70.2R 3,908,553

CLASS 104

53 3,908,554
130 3,908,555
134 3,908,556

CLASS 105

329R 3,908,557
376 3,908,558
453 3,908,559

CLASS 106

49 3,909,277
65 3,909,278
180 3,909,279
271 3,909,280
285 3,909,281
288B 3,909,283
288Q 3,909,282
289 3,909,284
306 3,909,285
3,909,286

CLASS 108

2 3,908,560
6 3,908,561
14 3,908,562
77 3,908,563
111 3,908,564
147 3,908,565
153 3,908,566

CLASS 111

7 3,908,567

CLASS 112

67 3,908,568
197 3,908,569
410 3,908,570
441 3,908,571

CLASS 113

1E 3,908,572

CLASS 114

43.5VC 3,908,573
74R 3,908,574
206R 3,908,575
230 3,908,576

CLASS 115

1B 3,908,580
1R 3,908,577
6.1 3,908,578
17 3,908,579

CLASS 116

63P 3,908,581
114R 3,908,582

CLASS 118

2 3,908,583
3,908,584
48 3,908,585
49.1 3,908,586
50 3,908,587
58 3,908,588
60 3,908,589
122 3,908,590
308 3,908,591
313 3,908,592
620 3,908,593
637 3,908,594
3,908,595
3,908,596

CLASS 119

1 3,908,597
5 3,908,598
20 3,908,599
51R 3,908,600
52AF 3,908,601

CLASS 122

4D 3,908,602
209R 3,908,603
250R 3,908,604
382 3,908,605

CLASS 123

3 3,908,606
8.01 3,908,607
3,908,610
8.05 3,908,608
8.09 3,908,609
8.13 3,908,611
3,908,612
25C 3,908,613
32EA 3,908,614
32SP 3,908,625
32ST 3,908,624
90.35 3,908,615
117R 3,908,616
119A 3,908,618
119B 3,908,617
122AB 3,908,620
139BD 3,908,619
139R 3,908,621
148E 3,908,622
197A 3,908,623

CLASS 124

15 3,908,626

CLASS 125

11TP 3,908,627

CLASS 126

91A 3,908,628
119 3,908,629
120 3,908,630
270 3,908,631
271 3,908,632
288 3,908,633

CLASS 127

57 3,909,287
68 3,909,288

CLASS 128

1R 3,908,634
2F 3,908,637
3,908,638
2M 3,908,635
2.05R 3,908,639
2.05T 3,908,636
3,908,640
2.06G 3,908,641
40 3,908,642
83 3,908,643
90 3,908,644
97 3,908,645
130 3,908,646
145A 3,908,647
146.6 3,908,648
147 3,908,649
152 Re.28,560
156 3,908,650
173H 3,908,651
214E 3,908,652
214R 3,908,653
218M 3,908,654
256 3,908,655
275 3,908,656
278 3,908,657
283 3,908,658
287 3,908,659
305 3,908,660
3,908,661
334R 3,908,662
349R 3,908,663
350R 3,908,664
351 3,908,665
372 3,908,666
419PG 3,908,667
419P 3,908,668
422 3,908,669
482 3,908,670

CLASS 131

15R 3,908,671

CLASS 132

7 3,908,672
9 3,908,673
53 3,908,674
82R 3,908,675
88.7 3,908,676
91 3,908,677
92A 3,908,678
116 3,908,679

CLASS 134

2 3,909,289
6 3,909,290
27 3,908,680
94 3,908,681
115G 3,909,291

CLASS 136

27 3,909,292
36 3,909,293
81 3,909,294
83R 3,909,295
3,909,296
86A 3,909,297
3,909,298
86C 3,909,299
134R 3,909,300
3,909,301
177 3,909,302
3,909,303

CLASS 137

15 3,908,682
15.1 3,908,683
68 3,908,684
84 3,908,685
94 3,908,686
106 3,908,687
110 3,908,688
149 3,908,689
172 3,908,690
315 3,908,691
355.16 3,908,692
493 3,908,693
513.3 3,908,694
580 3,908,695
604 3,908,696
625.26 3,908,699
625.3 3,908,698
625.47 3,908,697
625.65 3,908,700
630.15 3,908,701

CLASS 138

42 3,908,702
120 3,908,703
121 3,908,704
149 3,908,705

CLASS 139

12 3,908,706
122H 3,908,707
124A 3,908,708
127R 3,908,709
194 3,908,710
419 3,908,711

CLASS 140

1 3,908,712
71R 3,908,713
71.5 3,908,714
111 3,908,715

CLASS 141

1 3,908,716
46 3,908,717
59 3,908,718
82 3,908,719
93 3,908,720
128 3,908,721

CLASS 144

2XA 3,908,722
2R 3,908,723
143 3,908,724
317 3,908,725

CLASS 145

33E 3,908,726

CLASS 148

1.5 3,909,304
3,909,305
3,909,306
3,909,307
3,909,308
11.5F 3,909,309
11.5R 3,909,310
12.1 3,909,311
24 3,909,312
113 3,909,313
146 3,909,314
153 3,909,315
156 3,909,316
171 3,909,317
175 3,909,318
187 3,909,319
3,909,320
190 3,909,321

CLASS 149

19.4 3,909,322
19.7 3,909,323
76 3,909,324

CLASS 151

7 3,908,727

CLASS 156

17 3,909,325
69 3,909,326
89 3,909,327
219 3,909,328
234 3,909,329
252 Re.28,563
3,909,330
253 3,909,331
309 3,909,332
331 3,909,333
378 3,909,334
396 3,909,335
405 3,909,336
416 3,909,337
422 3,909,338
477R 3,909,339
500 3,909,340
502 3,909,341
522 3,909,342
538 3,909,343

CLASS 157

1.22 3,908,728
1.5 3,908,729

CLASS 160

90 3,908,730
231A 3,908,731

CLASS 162

19 3,909,344
72 3,909,345
152 3,909,347
155 3,909,346
166 3,909,348
317 3,909,349

CLASS 164

4 3,908,732
52 3,908,736
60 3,908,733
66 3,908,734
3,908,735
76 3,908,737
80 3,908,738
3,908,739
3,908,740
3,908,741
3,908,742
3,908,743
82 3,908,744
87 3,908,745
152 3,908,746
154 3,908,747
329 3,908,748

CLASS 165

2 3,908,749
26 3,908,750
27 3,908,751
35 3,908,752
39 3,908,753
86 3,908,754
89 3,908,755
158 3,908,756
167 3,908,757
174 3,908,758

CLASS 166

117.6 3,908,759
246 3,908,760
250 3,908,761
263 3,908,762
302 3,908,763
305R 3,908,764

CLASS 172

4.5 3,908,765

CLASS 173

12 3,908,766
78 3,908,767
93 3,908,768

CLASS 174

11R 3,909,500
15C 3,909,501
48 3,909,502
3,909,503
52PE 3,909,504
72A 3,909,505
88C 3,909,506
102SC 3,909,507
102P 3,909,555
117M 3,909,508
152R 3,909,509

CLASS 175

48 3,908,769
65 3,908,770
393 3,908,771

CLASS 176

30 3,909,350
87 3,909,351

CLASS 177

17 3,908,772
122 3,908,773

CLASS 178

2R 3,909,510
3 3,909,511
5.6 3,909,512
6 3,909,513
3,909,514
3,909,515
6.6A 3,909,517
6.6R 3,909,516
3,909,518
6.8 3,909,519
7.1 3,909,520
7.2 3,909,521
7.3R 3,909,522
7.8 3,909,523
7.85 3,909,524
3,909,525
66R 3,909,526
3,909,527
69.5R 3,909,528

CLASS 179

1SA 3,909,533
1SC 3,909,532
1UW 3,909,529
1E 3,909,530
3,909,531
1.5R 3,909,534
2AS 3,909,536
2C 3,909,535
6R 3,909,537
3,909,538
15BS 3,909,541
15BT 3,909,539
15BY 3,909,540
18AH 3,909,542
18FD 3,909,544
18B 3,909,543
27FA 3,909,546
27G 3,909,545
40 3,909,547
81B 3,909,548
84VF 3,909,549
3,909,550
99 3,909,551
3,909,552
3,909,553
3,909,554
107FD 3,909,556
115.5VC 3,909,557
141 3,909,558
170NC 3,909,559
170J 3,909,560
175.2C 3,909,561
175.2R 3,909,562
175.31R 3,909,563

CLASS 180

1F 3,908,774
44R 3,908,775
65F 3,908,776
69C 3,908,777
77MC 3,908,778
79.2R 3,908,779
82R 3,908,780
91 3,908,781
103 3,908,782
116 3,908,783
119 3,908,784
127 3,908,785

CLASS 181

.5 3,908,786
30 3,908,787
33S 3,908,788
113 3,908,789
198 3,908,790

CLASS 182

8 3,908,791
37 3,908,792
82 3,908,793
91 3,908,794
118 3,908,795
201 3,908,796

CLASS 184

1.5 3,908,797
6.5 3,908,798
38R 3,908,799

CLASS 186

1R 3,908,800

CLASS 187

88 3,908,801

CLASS 188

71.8 3,908,802
3,908,803
170 3,908,804
181A 3,908,805

CLASS 191

66 3,908,806

CLASS 192

6A 3,908,807
44 Re.28,561

CLASS 195

28R 3,909,352
29 3,909,353
31F 3,909,354
3,909,355
47 3,909,356
51R 3,909,357
63 3,909,358
65 3,909,359
68 3,909,360
80R 3,909,361
81 3,909,362
103.5R 3,909,363

CLASS 197

18 3,908,809
133R 3,908,810
175 3,908,819
189 3,908,820

CLASS 198

16MS 3,908,811
22B 3,908,812
24 3,908,813
34 3,908,814
37 3,908,815
41 3,908,816
76 3,908,817
161 3,908,818

CLASS 200

5E 3,909,564
38R 3,909,565
51.07 3,909,566
61.08 3,909,567
61.45 3,909,568
61.53 3,909,569
144C 3,909,570
148A 3,909,572
148B 3,909,571
258 3,909,573

CLASS 201

2.5 3,909,364

CLASS 203

6 3,909,365
69 3,909,366

CLASS 204

18R 3,909,367
26 3,909,368
29 3,909,369
32R 3,909,370
38A 3,909,371
43R 3,909,404
51 3,909,372
55R 3,909,373
3,909,374
64R 3,909,375
73 3,909,376
95 3,909,377
98 3,909,378
129.2 Re.28,564
159.22 3,909,379
180P 3,909,381
3,909,382
180R 3,909,380
186 3,909,383
195G 3,909,384
195R 3,909,386
195S 3,909,385
206 3,909,387
224M 3,909,388

CLASS 206

73 3,908,821
278 3,908,822
292 3,908,823
312 3,908,824
315 3,908,825
463 3,908,826
478 3,908,827
504 3,908,828
550 3,908,852

CLASS 208

4 3,909,389
10 3,909,390
108 3,909,391
120 3,909,392
139 3,909,393
3,909,394
196 3,909,395
213 3,909,396

CLASS 209

3 3,909,397
80.5 3,908,829
156 3,909,398
166 3,909,399
240 3,909,400
412 3,909,401

CLASS 210

27 3,909,402
32 3,909,403
46 3,909,405
47 3,909,406
49 3,909,407
59 3,909,408
60 3,909,409
71 3,909,410
159 3,909,411
166 3,909,412
219 3,909,413
232 3,909,414
234 3,909,415
242 3,909,416
3,909,417
336 3,909,418
518 3,909,419

CLASS 211

55 3,908,830
88 3,908,831
133 3,908,832

CLASS 214

6DK 3,908,834
6FS 3,908,835
6B 3,908,833
8.5F 3,908,836
10 3,908,837
3,908,838
17DA 3,908,839
17DB 3,908,840
83.36 3,908,841
86A 3,908,842
138 3,908,843
145 3,908,844
147G 3,908,846
147R 3,908,845
314 3,908,847
508 3,908,848
672 3,908,849

CLASS 217

70 3,908,850

CLASS 219

10.55A 3,909,574
50 3,909,575
51 3,909,576
69D 3,909,577
82 3,909,578
83 3,909,579
105 3,909,580
120 3,909,581
121LM 3,909,582
3,909,584
121L 3,909,583
130 3,909,585
3,909,586
270 3,909,587
295 3,909,588
361 3,909,589
390 3,909,590
438 3,909,591
462 3,909,592

CLASS 220

3	3,908,851
18	3,908,853
74	3,908,854
91	3,908,855
269	3,908,856
359	3,908,857

CLASS 221

75	3,908,858
118	3,908,859
161	3,908,860

CLASS 222

1	3,908,861
63	3,908,862
103	3,908,863
105	3,908,864
135	3,908,865
	3,908,866
145	3,908,867
	3,908,868
148	3,908,869
321	3,908,870
400.7	3,908,871
469	3,908,872
480	3,908,873

CLASS 223

43	3,908,874

CLASS 224

5A	3,908,875
42.1B	3,908,876
45S	3,909,718
48A	3,908,877

CLASS 225

96.5	3,908,878
103	3,908,879

CLASS 226

3	3,908,880
19	3,908,881
67	3,908,882
74	3,908,883

CLASS 227

130	3,908,884
152	3,908,885

CLASS 228

1	3,908,886

CLASS 229

1.5C	3,908,887
16A	3,908,888
35	3,908,889
37R	3,908,890
51DB	3,908,891
73	3,908,892

CLASS 233

20R	3,908,893

CLASS 235

61.11E	3,909,594
61.11R	3,909,595
61.6R	3,908,894
61.9R	3,909,593
70A	3,908,895
92PD	3,909,596
150.5	3,909,597
151.1	3,909,601
151.11	3,909,600
151.3	3,909,598
	3,909,599
	3,909,602
151.34	3,909,603
152	3,908,896
	3,909,604
	3,909,605
153R	3,909,606
156	3,909,626

CLASS 236

14	3,908,897
21B	3,908,898
46	3,908,899

CLASS 237

12.3A	3,908,900
81	3,908,901

CLASS 238

83	3,908,902

CLASS 239

2S	3,908,903
4	3,908,904
55	3,908,905
58	3,908,906
184	3,908,907
265.35	3,908,908
276	3,908,909
280	3,908,910
533	3,908,911

CLASS 240

41BM	3,909,607

CLASS 241

20	3,908,912
101.7	3,908,913
	3,908,914
208	3,908,915
213	3,908,916

CLASS 242

18PW	3,908,917
18R	3,908,918
43	3,908,919
45	3,908,920
47.01	3,908,921
54R	3,908,922
56R	3,908,923
	3,908,924
68.3	3,908,925
72B	3,908,926
84.21A	3,908,927
107.4	3,908,928
150	3,908,929
197	3,908,930
199	3,908,931
222	3,908,932

CLASS 244

3.21	3,908,933
77D	3,908,934
83E	3,908,935
117A	3,908,936
148	3,908,937
152	3,908,938

CLASS 246

182R	3,908,939

CLASS 248

18	3,908,940
23	3,908,941
158	3,908,942
159	3,908,943
162	3,908,944
165	3,908,945
188.7	3,908,946
	3,908,947
223	3,908,948
	3,908,949
291	3,908,950
358R	3,908,951
360	3,908,952
421	3,908,953
447	3,908,954
470	3,908,955

CLASS 249

40	3,908,956

CLASS 250

202	3,909,608
226	3,909,609
305	3,909,610
306	3,909,611
307	3,909,612
319	3,909,613
324	3,909,614
358	3,909,615
384	3,908,957
491	3,909,616
493	3,909,617

CLASS 251

95	3,908,958
133	3,908,959

CLASS 252

8.55B	3,909,422
8.55D	3,909,421
	3,909,423
12	3,909,424
17	3,909,426
32.7E	3,909,425
33	3,909,427
42.7	3,909,428
46.7	3,909,429
47	3,909,420
49.9	3,909,430
54	3,909,431
59	3,909,432
62.1	3,909,433
63.7	3,909,434
64	3,909,435
107	3,909,436
143	3,909,437
186	3,909,438
187R	3,909,439
188.3	3,909,440
300	3,909,441
	3,909,442
301.4F	3,909,443
316	3,909,444
321	3,909,445
373	3,909,446
389A	3,909,447
402	3,909,448
422	3,909,449
438	3,909,450
441	3,909,451
455R	3,909,452
	3,909,453
	3,909,454
466J	3,909,455
472	3,909,456
476	3,909,457
501	3,909,458
509	3,909,459
532	3,909,460
539	3,909,461

CLASS 254

29R	3,908,960
51	3,908,961
134.3R	3,908,962
172	3,908,963

CLASS 256

10	3,908,964

CLASS 259

1R	3,908,965
4	3,908,966
153	3,908,967
191	3,908,968

CLASS 260

2.5AJ	3,909,464
2.5AW	3,909,465
2.5F	3,909,463
3	3,909,466
8	3,909,467
	3,909,468
15	3,909,469
17.3	3,909,470
22R	3,909,471
23XA	3,909,472
23.7M	3,909,473
28	3,909,474
29.1SB	3,909,475
29.6H	3,909,476
29.7H	3,909,477
31.4R	3,909,478
33.6UA	3,909,479
37EP	3,909,480
37N	3,909,481
40P	3,909,482
40R	3,909,483
	3,909,484
	3,909,485
42	3,909,486
42.15	3,909,487
42.49	3,909,488
45.7R	3,909,489
45.7S	3,909,490
	3,909,493
45.75S	3,909,492
45.8NT	3,909,491
47EP	3,909,494
51R	3,909,495
75H	3,909,496
77.5A	3,909,497
78L	3,909,498
562R	3,909,462

CLASS 266

17	3,908,969
20	3,908,970
	3,908,972
23K	3,908,973

CLASS 267

102	3,908,974

CLASS 269

40	3,908,975
	3,908,976
287	3,908,977

CLASS 270

58	3,908,978
86	3,908,979

CLASS 271

3	3,908,980
	3,908,981
21	3,908,982
35	3,908,983
113	3,908,984
189	3,908,985
227	3,908,986

CLASS 272

57F	3,908,987
66	3,908,988

CLASS 273

1R	3,908,989
26E	3,908,990
32R	3,908,991
55R	3,908,992
60R	3,908,993
61R	3,908,994
73G	3,908,995
83	3,908,996
119A	3,908,997
131AB	3,908,998
131AD	3,909,000
131KC	3,908,999
136F	3,909,001
138A	3,909,002
157R	3,909,003
162B	3,909,004
171	3,909,005
176AA	3,909,006
177A	3,909,007

CLASS 274

37	3,909,008
	3,909,009

CLASS 277

1	3,909,010
11	3,909,011
15	3,909,012
25	3,909,013
72R	3,909,014
81P	3,909,015
165	3,909,016
168	3,909,017
206A	3,909,018
209	3,909,019

CLASS 279

1H	3,909,020
2R	3,909,021
47	3,909,062

CLASS 280

6H	3,909,022
11.13B	3,909,024
11.35D	3,909,028
11.35K	3,908,971
	3,909,025
11.35N	3,909,027
11.35T	3,909,023
	3,909,026
	3,909,029
	3,909,030
11.37K	3,909,031
47.34	3,909,032
	3,909,034
124F	3,909,035
	3,909,036
150AB	3,909,037
150SB	3,909,041
150B	3,909,038
	3,909,039
150.5	3,909,040
204	3,909,042
269	3,909,043
432	3,909,044
477	3,909,033

CLASS 285

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329	3,909,049

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169	3,909,052

CLASS 293

62	3,909,053

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320	3,909,637

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9.7	3,909,641
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106	3,909,662
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169TV	3,909,665
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395	3,909,671

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2 : 3,908,753	3,908,623	3,909,103	3,909,790	3,909,507	3,908,327
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